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THESIS

THE IMPACT OF THE DRAWDOWN ON MINORITY OFFICER RETENTION

by

Brian D. Miller

March, 1995

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by

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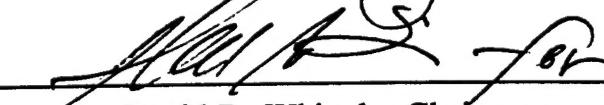
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ABSTRACT

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I. INTRODUCTION

A. WHY EXAMINE MINORITY OFFICER RETENTION DURING THE DRAWDOWN?

Minority representation in the U.S. Armed Forces has long been a subject of considerable concern to policy makers and elected officials. Since the advent of the All-Volunteer Force, the discussion has centered mostly on the trade-off between the peacetime benefits and the wartime burdens associated with minorities and military service (Binkin and Eitelberg, 1982). The dilemma stems from the fact that, following the end of conscription in 1973, minorities, especially blacks, began entering the military in increasing numbers. By the end of the 1980's blacks represented more than 20 percent of the nation's military, and in the Army's enlisted ranks, African-American representation exceeded 30 percent. (Binkin, 1993)

Many who viewed this phenomenon considered it a good thing. The military is generally thought of as being less racially discriminatory than other civilian institutions in our society, and is also viewed as an important source of valuable education, training, and job experience. In short, the military is considered a "great place to start," especially for young minorities interested in upward economic and social mobility. (Binkin and Eitelberg, 1982)

Others view this influx of minorities into the military less generously. They have stressed that the desired opportunities present during peacetime must be balanced against the potential perils when the nation is at war. Some argue that it is inequitable, even immoral, for one segment of the population to bear a disproportionate share of the nation's defense, especially when that segment has not fully enjoyed its share of the nation's benefits. (Binkin and Eitelberg, 1982)

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Indeed, in the early years of the Vietnam Conflict, 1961 through 1966, blacks sustained just over 20 percent of the Army combat deaths, while constituting only 11 percent of the U.S. population between the ages of 19 and 21. The death rate was, however, commensurate with black representation in Army combat units, prompting very vocal opposition toward the war and the draft by black leaders, including Dr. Martin Luther King, Jr. By the end of the war, new Army assignment policies and practices had reduced the overall Vietnam-related death rate for blacks to just over 13 percent 1972. (Binkin and Eitelberg, 1982)

As the Vietnam Era passed and faded quickly into memory, the minority representation issue seemed to wax and wane in the eyes of defense policymakers. Concern about the racial/ethnic composition of the military probably peaked in 1979, when blacks accounted for nearly 37 percent of the Army's recruits. The decade of the 1980s saw most observers content to let market forces determine the extent of minority participation in the armed forces. However, in early August of 1990, Iraq invaded Kuwait. It soon became apparent that the U.S. and its allies were committed to using force, if necessary, to liberate Kuwait. As scenarios began to develop, military experts speculated that a ground war was likely to generate a large number of casualties. Once again, as happened two decades earlier with Vietnam, racial representation in the military regained prominence in the public's eye. Many black leaders, including the Rev. Jesse Jackson, condemned American involvement in the Persian Gulf, and argued that the country could not afford to lose a large number of high-aptitude young blacks in a foreign war. (Binkin, 1993)

The Chairman of the Joint Chiefs of Staff, Army General Colin Powell, disagreed, however, with the concern over disproportionate black casualties. He stated that this

decision had been made when the country decided to shift to the All-Volunteer Force in 1973. (Binkin, 1993)

Quite simply, the Gulf War did not develop as predicted, and the controversy came to an abrupt end. Of the 375 U.S. casualties in Operation Desert Storm/Desert Shield, 16.8 percent were black. (Eitelberg, 1991). As attention turned away from the battlefield and back toward reducing the budget, concerns for minorities also shifted toward the economic realm. (Binkin, 1993)

This discussion thus far has centered primarily on minorities as enlisted members of the armed forces, but what about minorities as officers? The running debate concerning black overrepresentation in the enlisted ranks has dominated discussion of minority participation in the military. Yet, blacks and other minorities have also been considerably underrepresented in the military's officer corps since the time nonwhites were permitted to serve in this capacity. Many point to the huge disparity between minority representation in the enlisted and officer ranks as a key factor in the racial unrest of the 1960s and 1970s (Kitfield, 1994). Military manpower officials have also stressed the importance of minority recruits being able to identify with positive role models in leadership positions (Kitfield, 1994). Additionally, many minority groups feel that, if they are not proportionally represented in the officer corps, especially at the senior levels, they may not receive fair treatment when it comes to formulating and implementing manpower policies.

How, then, are these issues complicated by a downsizing environment? With the proposed and partially implemented reduction in military manpower (as of early 1995) through the defense drawdown, many minority leaders as well as the media have expressed concerns that blacks and others may be forced out of a smaller military (Binkin, 1993). As the requirement for new members, both officers and enlisted, decreases, the

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Services can afford to be more selective in the quality of applicants they accept. Since there are significant differences between whites and minorities in levels of education, as well in the test scores and other criteria used to select new officers and enlistees, the fear is that minorities will bear the brunt of the military's decreased need for personnel. (Binkin, 1993)

Additionally, there are some indications that the black population may be losing interest in military service. An annual attitude survey of high school seniors recently reported a 45 percent decrease in the propensity of black youths to enlist in the Army between 1991 and 1993 (Kitfield 1994). Couple that with the Army's inexplicable, widening gap in the promotion rates of minorities and non-minorities to the ranks of major and lieutenant colonel from 1990 to 1992, and apparent difficulties of the military's senior leaders in dealing with accusations of alleged racial discrimination (Kitfield, 1994), one can see that minority issues will remain, and perhaps intensify, throughout the drawdown.

Presumably, all of these issues--the benefits versus burden dilemma, rumors of inequity within the promotion system, decreased numbers of service members, and a possible decline in the propensity of young minorities to enter the military--have an impact on the observed retention behavior of minority officers. External to these issues within the military, it must be noted that there is a keen competition between the military and the private sector for highly qualified minorities. These minorities must be accessed before they can be retained. Considering these problems, one finds that the discussion of minority officer retention during the drawdown takes on greater relevance.

Finally, although Department of Defense policies have supported the recruitment and retention of qualified minorities in all phases of the manpower system, drawdown

policies have been designed primarily to meet endstrength goals without consideration of any potential effects on specific groups. Similarly, the military downsizing has eliminated many positions and facilities that may affect the opportunities for some officer groups differently than for others. This myriad of factors must be considered when discussing the current state of minority officer retention.

B. SCOPE AND OBJECTIVES

Utilizing cross-sectional and cohort data provided by the Defense Manpower Data Center (DMDC), this thesis seeks to determine whether differences exist in the retention of minority and non-minority officers; and, if differences are found, whether they have changed during the defense downsizing or can be linked to particular policies. Additionally, the research attempts to identify the impact of a specific, widely-used drawdown program, namely the Voluntary Separation Incentive/Special Separation Bonus (VSI/SSB), on minority and non-minority officers.

Retention decisions are not independent of certain other factors, such as promotion and accession. Consequently, these factors are also considered in the context of their effect on retention. It should be emphasized that the scope of this research is very broad in that it examines all services, all officer paygrades, and all occupational specialties. Consequently, many of the comparisons presented must be general in nature, especially with respect to cross-service information on occupational representation. The strongest conclusions are drawn from the empirical analysis for each individual service branch.

C. RESEARCH QUESTIONS

The primary research questions addressed by this thesis are:

- How has the racial mix of the officer corps changed across services, paygrades, and occupations during the drawdown period (fiscal 1988 to present)?

- Do significant differences exist in the retention/separation behavior of non-minority and minority officers, and, if so, have these differences increased or decreased over the drawdown period?

- What factors, including racial/ethnic background, have had the greatest impact on officer retention throughout the drawdown period?

- Do significant differences exist in VSI/SSB acceptance rates of officers across racial/ethnic groups, and what other factors appear to be important in the acceptance decision?

D. ORGANIZATION OF STUDY

The remainder of this thesis is divided into four chapters. Chapter II reviews literature pertinent to the subjects of minority representation and management downsizing, as well as links between the two separate streams of research. Downsizing in both the military and civilian sectors is considered, as well as recent research regarding retention and separation incentives. Chapter III presents the data as well as the methodologies used to analyze the multiple data files that were created for this research effort. Chapter IV then presents the results of the analyses. Chapter V follows with conclusions and recommendations based upon the findings from previous chapters.

II. LITERATURE REVIEW

A. MINORITY REPRESENTATION

1. Introduction

When discussing minority underrepresentation in the officer corps, as well as other minority representation issues, three broad areas of national policy are often called into question (Eitelberg and Binkin, 1982). The first of these policy areas has been termed "political legitimacy" and states that a force drawn proportionately from society is most likely to respect and advance society's values and goals. Conversely, an unrepresentative force might place parochial interests above the interests of society as a whole. (Armor, 1991)

The second policy area involves concerns over "force effectiveness." It is generally accepted that a higher quality force (in terms of education and aptitude) will exhibit greater effectiveness in combat; and, therefore, an unrepresentative force might be less effective if it is disproportionately comprised of less-educated, lower-aptitude individuals. (Armor, 1991)

The third, and perhaps most fundamental policy area, concerns the "social equity" of a military force. This addresses the extent to which the burden and risk of defending the nation is borne by all segments of the population. Placing this burden disproportionately on one socioeconomic or racial/ethnic group is viewed by many as inequitable (Armor, 1991). The friction that has resulted from the opposing goals of allowing previously underprivileged groups the economic benefits of military service, while at the same time carrying a proportionate share of the defense burden, is often termed the "benefits versus burdens dilemma" (Binkin and Eitelberg, 1982).

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From these three areas of national policy, directly related to social representation, stem multiple conflicting objectives. A reasonable balance or compromise must be sought to ease the tensions between the goals of political legitimacy, force effectiveness, and social equity. (Eitelberg and Binkin, 1982)

2. Equity and Effectiveness

Discussion over the conflicting goals of obtaining a racially balanced officer corps and maintaining force effectiveness are not new to America's military. Consider the following quotation from a War Department memorandum dated July 13, 1918:

> 1. The claim..., that for each 250 colored men there should, in equity, be 5 colored officers, or 4,000 colored officers for the 200,000 colored men now called into the service instead of 1,000, the actual number, presupposes that there is an unlimited supply of colored men with sufficient education, intelligence and with qualities of leadership to meet all demands. Our experience is to the contrary....
>
> 2. It is not believed that the colored race is entitled to any definite number or proportion of colored officers as a matter of right or equity. At the same time it is believed that it is very desirable that all these colored men who have the intelligence and force of character to become capable officers in the lower grades should be given an opportunity to obtain a commission. The number of colored men capable of developing into commissioned officers will be quite small at best....Officers must be of the best obtainable material....Sentiment should have no place in the selection of officers where such sentiment would be detrimental to efficiency....(Jervey, 1918)

As can be seen, for at least the past 75 years, military manpower officials and policy makers have grappled with the task of obtaining qualified minority officers. For three decades following World War I, minority staffing concerns focused predominantly on the Army's all black units. With the

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racial integration of the military in the late 1940s and early 1950s, the Civil Rights movement of the 1960s, and the end of the draft in the 1970s, these concerns shifted toward creating equal opportunities for minorities in the military and achieving some measure of racial/ethnic representation across all services, all ranks, and all occupational specialties.

Before one considers the question of how to fill the military with a racially representative mix, a more basic question needs to be addressed: "Is it even desirable to have a fully representative force; and, if so, at what cost?" Each of the services is charged with the task of fielding the strongest and most capable force, given available resources. Complete or "perfect" representation would require that the worst as well as the best elements of our society be present in the military; and that the military recruit and retain not the most qualified force, but the most representative. Obviously, however, the lowering or elimination of entry criteria or performance standards to maintain a representative force would be contrary to national security goals. (Eitelberg and Binkin, 1982)

At the same time, the disproportionate representation of social, economic, racial, or ethnic categories may itself have an adverse influence on force effectiveness (Eitelberg and Binkin, 1982). Although the Defense Manpower Commission addressed this issue in 1975 and found no evidence that socioeconomic composition affects readiness (Eitelberg and Binkin, 1982), many manpower experts believe that the huge disparity between minority representation in the enlisted and officer ranks was a key factor in the racial unrest present in the military in the late 1960s and 1970s (Kitfield, 1994). This racial unrest actually escalated into rioting at Camp Lejuene and Kaneohe Naval Air Station in 1969, Travis Air Force Base in 1971, and onboard the carriers *Kitty Hawk* and *Constellation* in 1972 (Segal, 1989).

Without hard evidence on the requirements for population representation, many questions pertaining to effectiveness have persisted throughout the period of the All-Volunteer Force. Some of these questions, presented by Eitelberg and Binkin (1982), are reiterated here:

- How do racial imbalances affect the unity, cohesion and morale of a force?

- Does intergroup diversity reduce or improve effectiveness in the field?

- What impacts would an unrepresentative force have on civil-military relations?

- What impact does public opinion concerning social representation have on force effectiveness?

- How does racial representation in the armed forces affect credibility with our allies and potential adversaries?

Although it is entirely likely that the effectiveness of the military is influenced by representation factors, the manner and degree of influence is open to speculation and debate (Eitelberg and Binkin, 1982).

One must remember, however, that the goals of military effectiveness are not independent of concerns for political legitimacy and social equity. The military, although obviously concerned with personnel quality, must likewise support the legal, political, or societal principles legitimacy and equity. The problem is exacerbated by the fact that there appears to be a strong correlation between racial background and the factors used by the military in its selection process. For example, blacks have historically scored lower on college entrance exams (such as the Scholastic Aptitude Test or Academic College Test) than other ethnic groups (Dubois, 1983). Since scores on these exams are used as a quality measure for candidates attempting to enter an

officer accession program, the goals of effectiveness and equity clash head on. Hence, there exists a basic conflict of purpose. Force effectiveness requires certain standards for entry, promotion, and retention; at the same time, the armed forces are expected to be a reflection of society. (Eitelberg and Binkin, 1982)

3. Current Trends in Attitude

Given the prevailing political winds and the tide of public opinion, it appears that a greater emphasis is being placed upon achieving an officer corps that is representative of the country's racial or ethnic make-up than was present in the past. For example, in June of 1994, Secretary of the Navy John Dalton announced that the Navy and Marine Corps should be taking in new minority officers at approximately their share of the population by 2001 (Fuentes and Pexton, 1994). This would require the minority officer representation in the Navy and Marine Corps to be approximately 12 percent black, 12 percent Hispanic, and 5 percent Asian/Pacific Islander (Fuentes and Pexton, 1994). This changes previous policy that, based upon Department of Education statistics, targeted black and Hispanic representation at 4.5 and 2.4 percent, respectively (Chief of Naval Personnel, 1994). The Army and Air Force have similar plans.

These goals are quite ambitious, indeed, given that they exceed existing goals by two or three times (Fuentes and Pexton, 1994). Additionally, one must remember that it takes four years to complete most officer accession programs (such as the military Academies or Reserve Officer Training Corps). Thus, the first officers under this plan will not be commissioned the fleet until around 1998 or 1999.

Consequently, the Marine Corps is continuing with its previously announced "2015 Plan" which states that, by the year 2015, 5 percent of Marine Corps colonels will be black and 4.7 percent will be Hispanic. The year 2015 was selected

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because it is the year when the newest second lieutenants will be senior enough to advance to the rank of colonel. (Fuentes and Pexton, 1994)

Given, the importance of minority representation in national military policy and the ambitious goals set by the armed services, it is important to examine the implications of the current defense downsizing effort on minority representation issues. The next section begins with a brief look at literature pertaining to organizational decline and downsizing strategies, and then considers the specific case of the Department of Defense drawdown as it affects both civilian and military personnel.

B. DOWNSIZING

1. Strategies for the Private Sector

Increasing environmental constraints within the private sector, especially upon the larger entities, have resulted in the proliferation of research in the field of organizational decline (Kirby, 1993). Managers attempting to "retrench" their organizations have looked toward many possible options, including reconfiguring work processes, modifying communication and reporting channels, and, of course, decreasing the size of the workforce (Kirby, 1993).

The research indicates that, in attempting to manage personnel reductions, a number of strategies are also available. The most common strategies were compiled in a 1992 American Management Association survey. They include: hiring freezes, demotions or transfers, salary reductions or freezes, early retirement incentives, voluntary separation incentives, voluntary job sharing, shortened work week/days, and limited duration furloughs. The survey also indicated an increasing trend in the use of voluntary separation and early retirement incentives. (Skocik, 1993)

The type of strategy implemented is itself dependent upon

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many factors. The depth of cuts required and the lead time allowed to implement the reduction are important (Kirby, 1993), as well as whether the company is facing a threat to its survival or is simply realigning (Perry, 1986). Organizational philosophy, legal constraints, outside influences, and the impact of the downsizing actions on both stayers and leavers must also be considered (Skocik, 1993).

Given these multiple considerations, it is not surprising that companies are turning more toward voluntary programs. These voluntary programs, also called "pull" strategies, produce less focused results, but are also less harsh than "push" strategies. Push strategies, such as personnel layoffs, are the most direct, and are potentially costly in terms of legal expenses (Felsenthal, 1994), employee morale, and organizational-societal relationships. (Kirby, 1993)

The difficulty, however, with voluntary separation programs (as alluded to previously) is that the organization has little control over who accepts. Although firms may target certain subgroups of their payroll, outcomes are still largely unpredictable; and there is a continuing concern that high-quality people will leave in greater numbers, as well as concerns over demographic factors such as race, gender, and age.

In summary, the literature indicates that organizations choosing to reduce personnel costs in response to environmental constraints have a number of options from which to choose. "Proactive" organizations afford themselves a wider range of options due to greater lead times and greater available resources. A downsizing effort that is managed poorly can result in negative consequences for both the firm and its employees. For this reason and others, there is an increasing emphasis on "pull" strategies or voluntary programs to accomplish reductions in personnel.

2. The DoD Civilian Workforce Reduction

Although the remainder of the federal civilian workforce increased by 104,000 employees (9 percent) from 1982-1992, civilian workers in the Department of Defense (DoD) actually decreased by almost 22,000 employees, or about 2 percent, with the reductions occurring after 1987 (Congressional Budget Office, 1993). This drop in DoD's civilian employment from 1987-1992 is a result of a number of factors. The perceived reduction in threat after the end of the Cold War and dissolution of the Soviet Union has led to a smaller military and, consequently, a smaller workload for civilian personnel. The decline in personnel has been accelerated by a number of management reforms aimed at increasing efficiency and decreasing infrastructure. The Defense Base Realignment and Closure Commissions (BRAC) of 1988, 1991, 1993, and 1995 offer evidence of such initiatives. (Congressional Budget Office, 1993)

The government has three standard approaches to reduce personnel: layoffs, hiring freezes, and early retirement programs. In recent years, Congress has also given DoD and other selected federal agencies the authority to offer cash incentives to employees who separate early. Although each approach to separating workers has its costs, analyses by the Congressional Budget Office (CBO) suggest that savings in pay and benefits far exceed costs no matter which strategy is employed, especially in the long term. Thus, the impact of non-cost considerations should be given as much weight as cost factors (Congressional Budget Office, 1993). These non-cost considerations, as detailed by CBO include:

- insuring that the remaining workforce has the right mix of skills;

- preventing growth in the average salary as a result of increases in the seniority of the workforce;

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- maintaining the diversity of the work force (in terms of race and gender); and

- preserving morale and productivity.

Of particular interest to this thesis is the impact of the downsizing actions--layoffs, hiring freezes, early retirements, and separation incentives--on the diversity of the workforce.

a. Layoffs

Layoffs are generally the least desirable method of reducing the workforce due to the potential damage on employee morale and productivity. Agencies, however, must resort to layoffs when the required reductions are concentrated in particular organizations, skills, or geographic locations, or must be implemented within a short time period. Reductions at DoD, though, have generally been widespread with respect to the above factors, resulting in an low average annual rate of layoffs at less than 1 percent of the workforce. (Congressional Budget Office, 1993)

Blue collar workers represented about 30 percent of DoD's civilian workforce between 1990 and 1992, yet represented about 60 percent of the layoffs. The reason for the disproportionate reduction in blue-collar workers was that the decreases in workload were greatest in jobs--such as depot maintenance, supply activities and base facility upkeep and maintenance--where blue-collar work predominates. (Congressional Budget Office, 1993)

Men, in turn, were also disproportionately affected by the layoffs, because they held almost 90 percent of the blue-collar jobs. Men represented 73 percent of persons who were laid off, while comprising only 60 percent of the total workforce. Women, who accounted for 9 percent of the blue-collar workforce, represented 13 percent of the blue-collar layoffs. Women's share in these layoffs was, however, proportional to their share of the workforce that was most

vulnerable to layoffs, persons with less than 12 years of service. At the same time, layoffs for women in the white-collar force were proportional to female representation in that force. (Congressional Budget Office, 1993)

CBO found that minorities were not disproportionately affected by the DoD layoffs. In the blue-collar force, for example, minorities represented 30 percent of the workforce and 26 percent of the layoffs. In addition, minorities accounted for the same proportion of layoffs in the white-collar force as their share of that sector. (Congressional Budget Office, 1993)

b. Hiring Freezes

Since the drawdown began, DoD has used partial or targeted hiring freezes as the most common tool for reducing employment. Between January 1990 and October 1992, DoD was able to reduce employment by 3 to 4 percent each year, primarily by reliance on a partial hiring freeze. The main concern, however, when implementing a hiring freeze is that shortages in particular occupations will develop, as well as an increase in the average salary of a worker, especially if the hiring freeze is left in place over a long period. Nevertheless, CBO concluded that, with careful management, these mismatches between work requirements and available skills can be avoided by using different replacement rates for different occupations, or, in other words, by targeting the freeze. (Congressional Budget Office, 1993)

An examination of the impacts of the hiring policies implemented at DoD during this period revealed little or no effect on the diversity of the workforce. From 1989 to 1992, gender and racial representation (as a percentage of the total population) did not change. Representation as a percentage of total accessions changed only slightly during the same period. The percentage of women accessed decreased from 50 to 49 percent, while the percentage of minorities entering the

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workforce increased from 32 to 34 percent. Effects on morale were also assumed to be minimal, especially when compared with layoffs. (Congressional Budget Office, 1993)

CBO did find, however, that average salary increased about 9 percentage points more than it would have without the freeze (11 percent versus 1.8 percent). This effect was attributed more to changes in occupational mix and grade structure than to the hiring restrictions. (Congressional Budget Office, 1993)

c. Early Retirement

CBO reported that early retirement packages could be used to reduce the size of the workforce by up to 2 percent annually. However, if separation incentives are available or under consideration, early retirement without some incentive of its own would be unlikely to attract many takers. The low acceptance rates for early retirement offers are explained by the financial penalty imposed by accepting such an offer, namely a smaller pension annuity. Most early-retirement-eligible employees are protected from involuntary separation by their seniority, and consequently choose to continue service, ultimately increasing their pensions. (Congressional Budget Office, 1993)

CBO found that the early retirement programs in DoD had only a small effect on the diversity of the workforce. Men and non-minority workers were slightly more likely to accept, thus marginally increasing diversity. Men accounted for 73 percent of persons who accepted an "early out," compared with 70 percent of those eligible, and 60 percent of the total workforce. Non-minorities took early retirement proportional to their share of the white-collar force and slightly higher than their share of the blue-collar force. (Congressional Budget Office, 1993)

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d. Separation Incentives

Separation incentives are seen as a means by which downsizing organizations can reduce the number of layoffs, ease job transition for separating workers, and restructure or reshape the remaining workforce. CBO, after examining the use of these incentives at the Postal Service and the Department of Defense, concluded that the "wise use" of separation incentives could help meet these goals. (Congressional Budget Office, 1993)

Although CBO did not comment on the impact of these incentives on the demographic profiles of the Postal Service and DoD, it did report satisfactory effects on the turnover rates among retirement eligible workers, the abolishment of targeted jobs, and substantial cost savings as long as workers were not replaced or were replaced with less costly workers. (Congressional Budget Office, 1993)

On the down side, CBO reported that incentives were likely to reduce normal turnover rates both before and while they are offered. Additionally, as the pool of eligibles shrinks, turnover would not increase as much as in the initial stages of the offerings. (Congressional Budget Office 1993)

e. Lessons Learned

CBO concluded that, with careful management, federal agencies can accomplish a drawdown of several percentage points annually, and simultaneously minimize layoffs by utilizing partial hiring freezes. If the drawdown is to be large or concentrated (in time or by occupation or geographic location), then separation incentives could be used to curtail the number of layoffs required. (Congressional Budget Office, 1993)

3. The Military Drawdown

As mentioned previously, the armed services have similarly faced the harsh fiscal realities of the late 1980s and the 1990s. Many factors, including the fall of the Soviet Union and increasing budgetary pressures at home, have

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resulted in a force reduction of substantial proportions (Skocik, 1993). Nowhere is this more evident than in the reductions of uniformed personnel that have occurred in all services. The military's downsizing plans in 1992 called for a reduction of 604,000 (28 percent) active duty personnel between 1992 and 1997. The Navy and Marine Corps planned cuts of 17 and 20 percent, respectively, while the Army and Air Force aimed for endstrength cuts of 33 percent. In 1992 alone, 153,000 positions were eliminated (Mehay, 1994). In attempting to achieve this large reduction in personnel within the planned timeframe, the services are employing a number of strategies similar to those used in the private sector and the federal civilian workforce. This section briefly describes the tools used by the services to reduce officer endstrength and comments on the strengths and limitations of such actions where appropriate.

a. Controlled Accessions

Perhaps, the least disruptive and most preferred method of reducing manpower is to implement a full or partial hiring freeze and allow normal attrition to reduce numbers, as demonstrated with respect to the DoD civilian workforce. Implementing such a policy in the military is, however, severely constrained by the nature of the internal labor market present in the services. With the exception of a relatively small number of scientists and professionals (doctors, dentists, lawyers, etc.), all new hiring is at the entry level and skilled workers are developed internally. A large reduction in accessions, could create an unbalanced personnel inventory, that, in turn, could have drastic implications for the future of the force in terms of experience, paygrade, and occupational mix (Mehay, 1994). For these reasons, the services have been able to rely on reduced accessions only in a limited manner to help meet officer endstrength goals throughout the drawdown.

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b. Reductions in Force

Perhaps the quickest, though least desirable, way to reduce the military is through a reduction-in-force (RIF). A RIF occurs when non-vested careerists (those with greater than six years of service), otherwise eligible to serve until retirement, are involuntarily separated. The usual procedure for implementing a RIF is a performance-based selection board. The board is given a quota and then selects the lowest performers from the eligible population (set by the services) for separation. RIFs are generally viewed as a last resort, due to the perception of breaking implicit long-term contracts with careerists and the subsequent adverse effects on morale or the military's reputation as an employer. (Mehay, 1994)

The Navy, which faced the lowest number of personnel cuts, has been able to avoid RIFs per se. The Navy has, however, relied on Involuntary Releases from Active Duty (IRADs). IRADs are technically not the same as RIFs in that they pertain to active duty reservists, who, by nature of their reserve status are not considered career personnel, even though they may have more than six years of active duty service.

Additionally, the services have greatly restricted the number of reservists allowed to augment to the Regular status, as well as commissioning all new officers, even those from the Academies and ROTC scholarship programs, into the Reserves. The purpose of these policies is, of course, to control entry into the "career force," and therefore reduce the possible need for a true RIF in the future.

c. Early Retirement

The services have additionally relied on two early retirement programs, one voluntary and one involuntary, to help meet officer endstrength throughout the drawdown period. The involuntary program is known as the Selective Early Retirement (SER), while the voluntary program is known as Temporary Early Retirement Authority (TERA).

The SER program is very similar in procedure to a RIF. In this case, however, the services designate SER zones for personnel who are (or are close to) retirement eligibility (20 years of service). A SER board then meets and decides which officers will be forced to retire, based again on quotas set by the individual services. The SER, like the RIF, is one of the most difficult aspects of the drawdown (Chief of Naval Operations, 1994b). For this reason, the military has been given the authority to offer an early retirement incentive.

Congress has authorized TERA for service use through September 1999. Also known as the 15-year retirement, TERA offers an early retirement option at a somewhat reduced monthly stipend to eligible members prior to completing 20 years of service. Eligibility is extended to active duty officers with at least 15 years of active service during the fiscal year of the program offering. TERA is not an entitlement, and, consequently, all who apply may not be approved. In this manner, the services are able to target the occupational specialties and years-of-service categories they wish to reduce within the officer inventory. Persons who retire under TERA receive the same retired pay as do those under the 20-year retirement except for a reduction of 1/12th percent for each month less than 20 years of service. Other benefits under TERA remain essentially unchanged from regular retirement. (Chief on Naval Operations, 1994c)

d. Separation Incentives

In addition to the early retirement programs mentioned above, DoD has been authorized by Congress to offer separation bonuses to career personnel to induce voluntary resignation prior to retirement eligibility (Mehay 1994). The program, entitled the Voluntary Separation Incentive/Special Separation Bonus (VSI/SSB), has two options and is offered on a selective basis to shape the structure of specific occupational specialties or communities, while still reducing

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end-strength. Although the program is authorized through September 1999, it is used on an "as needed" basis by the services, and may or may not be offered to the same or additional communities in subsequent years. (Chief of Naval Operations, 1994a)

Under the VSI option, separating members are paid an annual amount equal to 2.5 percent times their final monthly base pay multiplied by 12 times their years of service. Annual payments commence on separation from active duty and continue on each anniversary for a period equal to twice the number of years of active service. For example, an O-3 with 8 years of service would receive $7,256 dollars (less taxes) upon separation and for the next 15 years, for a total of $116,110. (Chief of Naval Operations, 1994a)

The SSB is a lump-sum payment equal to 15 percent times the final monthly base pay multiplied by 12 times the years of service. For example, an O-3 with 8 years of service would receive $43,541 upon separation. It should be noted that neither VSI nor SSB is a retirement plan and, consequently, the separating member does not receive commissary or exchange privileges, or medical benefits. Members separating must accept appointment in the Ready Reserve, three years for SSB recipients, and for the duration of payments for those accepting VSI. (Chief of Naval Operations, 1994a)

As can be seen, the VSI/SSB program is an excellent tool for military manpower managers to ensure the right mix of personnel with respect to paygrade, tenure, and occupation, while drawing down the force and minimizing RIFs. This tool, along with the early retirement programs and controlled accessions, are the primary means by which the military has implemented its massive downsizing in the officer corps. One must remember, however, that the threat of RIF, real or

perceived, is still lurking behind all efforts to reduce the force.

C. RETENTION THEORY AND BEHAVIOR

1. Introduction

Before attempting to assess the impact of drawdown actions on the retention of minority officers, it is important to examine the theoretical aspects of job separation. This section begins with a review of the firm-specific human capital and the job-matching theories of job separation. The Annualized Cost of Leaving (ACOL) model is also discussed since it is very pertinent to this research, especially when assessing the impact of monetary incentives. The section concludes with the results of previous studies in the areas of retention and separation incentives.

This study is complicated by the fact that officer retention is very different from enlisted retention. Enlisted members are at all times serving under an explicit contract. Upon expiration of their contract, they must either reenlist (sign another contract) or separate. Although most, if not all, officers have some minimum service obligation upon commissioning, they are not required to "reenlist" at the end of that obligation. Officers, then, serve by virtue of their commission and remain on active duty until they resign or are asked to leave the service. Additional obligations may be incurred, however, for such things as government-sponsored postgraduate education and advanced technical training. Officers wishing to leave the service must file a "Letter of Intent" (to resign) through their commanding officer to the service secretary. The date at which the officer leaves the service is then determined by the desires of the individual, the operational needs of the unit to which he or she is attached, and the needs of the service. Often, an officer wishing to separate at the end of his or her initial

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obligation will remain in service until the end of a current
tour, even if that date occurs after the obligated date of
service. For these reasons, retention decisions for officers
do not generally occur at a set point in time, as with a
first-, second-, or third-term enlistment contract for an
enlisted member. This lack of a well-defined decision point
makes analysis difficult, especially in the aggregate. In
fact, the data used for this research indicate, that, at least
at the DoD level, records of service obligations for
individual officers are not reliable. For these reasons, and
perhaps also due to the relative size of the enlisted force,
most retention research has been in the domain of
reenlistment.

2. Theories of Job Separation

The basic, underlying premise of the economic models of
job separation is that when either an employer or employee
anticipates that a separation will enhance his or her well-
being, the employee separates. Thus, in the case of the
employee, if the net present value of benefits, both pecuniary
and non-pecuniary, of the current job is less than those of an
alternative job, then he or she will separate (Buddin, 1984).
In the military context, retention usually refers to a
voluntary decision, and attrition refers to an involuntary
separation before completing one's obligation; however, the
distinction between the two may have little theoretical or
empirical importance. The theoretical differences are
ambiguous, and the empirical ones are complicated by service
policies that, in principle, prevent "quitting" before the end
of a service obligation. A dissatisfied member may,
nevertheless, set up conditions that lead to separation,
making it difficult to determine the party initiating the
separation. (Buddin, 1994)

Because, the initial "contracts" were satisfactory to
both the employer and employee, separation (either by quitting

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or firing) implies that some aspect has become unsatisfactory. The first two models of job separation discussed below, differ in their explanation of the changes that induce the dissatisfaction. The first is the firm-specific human capital model, and the second is the job-matching model. (Buddin, 1994)

a. *Firm-specific Human Capital Model*

Firm-specific human capital models assume that, although an employee may learn many skills from job experience, some special skills (firm-specific) that are not transferable to other jobs are also learned. The acquisition of these firm-specific skills is cumulative over time; therefore, one would expect the probability of separation to decrease with tenure. Additionally, the model suggests that separation rates are also a function of individual and firm characteristics, as well as investments in firm-specific human capital. Thus, factors such as education, age, race, family status, health, experience, unemployment history, and industry should be considered when examining job separations (Buddin, 1984). Ehrenberg and Smith (1994) also suggest that gender, firm-size, wage effects, and the cyclical changes in the economy are important to the firm-specific human capital theory.

Buddin (1984) summarizes with three hypotheses concerning job separations that emerge from the firm-specific human capital model:

- separation rates will decline with tenure;

- separation rates will be inversely related to individual characteristics (education, age, race, health, experience, etc.) that are complementary with investment in firm-specific human capital; and

- indicators of job mobility will be positively correlated with separation probability.

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b. Job-Matching Model

The basic premise behind the job-matching models of job separations is that individuals and firms enter into employment agreements with imperfect information. As new information is made available, each party reassesses the agreement and, if it becomes unsatisfactory the result is a wage adjustment, promotion, or separation. (Buddin, 1984)

Job-matching models may be divided into two categories based upon the source of uncertainty. The "experience" model theorizes that, through job experience, the individual learns more about his or her own skill. As new information is obtained, then the initial employment contract is reevaluated. If found to be unsatisfactory, then a change in employment may result. (Buddin, 1984)

"Search" models, on the other hand, assume that uncertainty stems from imperfect information pertaining to alternative jobs and not the current one. As the employee receives information concerning alternative employment opportunities, they may decide that they are better suited for employment elsewhere. Experience models are generally more appropriate for explaining early military separations (attrition), while the search models are probably more appropriate for later job separations (non-reenlistment). This is due to the fact that the individual has had more time to acquire general skills that may enhance employment opportunities in the civilian sector. (Buddin, 1984)

Buddin (1984) summarizes three predictions from the job-matching models with three hypotheses:

- job separations are likely to occur at low levels of tenure;

- the greater the uncertainty about the initial employment agreement, the greater the probability of a mismatch; and

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- the probability of mismatch and subsequent probability of separation are positively related to the ease of future separations as perceived at hiring.

c. Annualized Cost of Leaving Models

Cost-of-leaving models are useful when attempting to assess the impacts of monetary incentives—such as changes in retirement eligibility or voluntary separation incentives—on personnel retention. These models presume that the decision made by an individual to leave the military is dependent upon the net present values of the expected benefits, both pecuniary and non-pecuniary, of the two alternative sources of employment (Warner and Goldberg, 1984). The Annualized Cost of Leaving (ACOL) model, developed by Nelson and Warner, provide two major contributions to the study of retention decisions. First it provides a basis for determining the horizon over which to compare military and civilian pay; second, it relates the estimated retention equation more directly to the concept that individuals tend to act in their own best interest, or maximize utility. (Hogan and Black, 1991)

One approach to using this model is to decompose the cost of leaving into its component parts: military pay, civilian pay, and, if present, a separation bonus. Thus, in its simplest form the model is specified as:

$$ACOL = M - (C + B)$$

where M is the discounted expected stream of military compensation, C is the discounted expected of civilian compensation, and B is the effect of the bonus. The bonus in this case is added to the civilian alternative, since it is a separation bonus, increasing the expected stream of civilian compensation. If the value of ACOL is positive, the member will stay; if it is negative, he or she will separate. (Skocik, 1993)

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The perceived values of each income stream are, in turn, affected by personal discount rates. A variety of factors, including education, gender, race, age, probability of promotion, and probability of retirement, determine personal discount rates. These factors may then be useful for predicting acceptance of a separation incentive or early retirement program. For a fuller discussion of the ACOL model, see Warner and Goldberg (1984) or Hogan and Black (1991).

3. Previous Retention and Separation Incentive Studies

As mentioned previously, the vast majority of retention literature pertains to the enlisted force, with most research concentrating on the first reenlistment decision. By and large, the results of these studies confirm the theoretical models presented above. As an example, Cymrot (1987) examined the impact of Selective Reenlistment Bonuses (SRBs) on retention in the Marine Corps. He found that, not only did bonuses significantly increase retention, but that reenlistment and extensions also increased with the magnitude of the bonus multiplier. The next strongest factor increasing retention was rank, indicating perhaps the effect of higher pay and the development of firm-specific human capital.

A number of studies have recently examined the effects of VSI/SSB on the enlisted force. Kirby (1993) found that in a fiscal 1992 Navy program, all minorities were significantly less likely to accept the bonus. Other important variables included family status, occupational specialty, length of service, paygrade, and years left on enlistment contract. Giarrizzo (1993) and Skocik (1993) confirmed the impacts of racial background in a subsequent (fiscal 1993) Navy offering of VSI/SSB. An analysis of Army and Air Force enlisted personnel indicated that non-minorities were also more likely to accept VSI/SSB in those services (Beland and Collage, 1992).

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In all of these studies it is important to note that the vast majority of program participants (nearly 85 percent of takers in the fiscal 1992 Navy offering) elected the lump-sum bonus over the annuity. This suggests that the personal discount rates for these enlisted populations may be much higher than previously assumed. For example, using a discount rate of 7 percent, the present value of VSI for an E-5 with twelve years of service is $61,211, compared with $32,025 for SSB. At an 18 percent discount rate, the net present value of VSI is only $29,091, compared with the same amount for SSB. (Mehay, 1994)

Of the existing studies on officer retention, many have used survey data in an attempt to ascertain the key factors in an officer's decision to remain on active duty. A 1983 Marine Corps study reported that the two factors influencing retention the most, regardless of race, were job satisfaction and the treatment of the officer as an individual. Additionally, the study reported that racial discrimination was not a major factor; and that the lack of career and performance counseling, as well as the performance evaluation system, may be more detrimental to black officers "who because of educational and/or cultural deprivation, are 'slow starters' in their Marine Corps career." (Dubois, 1983)

Intrinsic factors, such as job satisfaction and perceptions of promotion probability, appeared to be more important than extrinsic factors in career decisions among Army and Marine Corps personnel in an analysis of the 1985 DoD Survey of Officer and Enlisted Personnel (Steele, 1987). An examination of the same data for Air Force officers reported, surprisingly, that officers with more experience were more likely to leave (Payne, 1988). Thielmann (1990) reported that minority officers stay at higher rates that non-minorities, based upon his analysis of the 1985 DoD survey, restricting his analysis to Marine Corps officers.

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A 1992 study of the effects of the downsizing on personnel quality, using data from the VSI/SSB programs, found that white officers were less likely to separate in the Army and Air Force. The study also concluded that, as years of education increased, the probability of separation increased. Other significant variables were commissioning source, marital status, number of dependents, and gender. (Beland and Collage, 1992)

D. SUMMARY

There are at least three broad areas of research that pertain to this thesis. First, the literature highlights the increasing importance of minority representation in all aspects of the military manpower system, including accession, promotion, attrition, and retention. The dilemma faced by manpower officials in attempting to staff a representative officer corps while, at the same time maintaining current measures of quality and force effectiveness, seems to be an ever-present theme.

Second, the field of organizational decline and personnel downsizing is important to the time period (1987 through 1994) examined by this research effort. This chapter presented the initiatives used for accomplishing personnel drawdowns in the private sector, federal civilian workforce, and the military. It is apparent that the current trend is to utilize less painful, voluntary strategies to reduce the workforce, rather than resort to layoffs or involuntary RIFs. The use of "pull" strategies to meet endstrength, however, makes it difficult for managers to control who will accept the separation incentives, therefore increasing concern over the possible changes to the demographic make-up of the workforce.

Finally, retention behavior and its underlying economic theories are pertinent to this research as attempts are made to explain separation behavior. The firm-specific human

capital, job-matching, and ACOL models were examined in this chapter to help understand the importance of monetary factors, as well as individual and firm characteristics, in the retention decision. These theories are to specify the empirical models of retention in the present study.

III. DATA AND METHODOLOGY

To meet the research objectives outlined in Chapter I, the statistical analysis in this thesis is carried out in three parts. The first part consists of a cross-sectional analysis of end-of-year extracts from the Officer Master File covering fiscal 1987 through 1994, inclusive. These end-of-year extracts provide a snapshot of the officer corps on the last day of the fiscal year and are useful in determining trends in minority representation during the 1987-1994 period examined. The second part consists of a longitudinal analysis of entry cohorts for four years; officers commissioned in 1977, 1980, 1983, and 1987. These cohort files are useful for modeling separation behavior and making comparisons across years when differing drawdown policies were in effect. The final part of this analysis consists of an examination of minority status on the decision to accept the VSI/SSB incentive offerings in the Air Force in fiscal 1992 and 1993, and in the Navy in fiscal 1993. This chapter describes the data and methodology used for the cross-sectional and longitudinal analyses. The data, methodology, and results of the VSI/SSB analysis are presented in Chapter V. All data were files provided by the Defense Manpower Data Center, Monterey, CA.

A. CROSS-SECTIONAL ANALYSIS

1. Frequency Distributions and Cross-Tabulations

Utilizing the DMDC cross-sectional data files for the years 1987 through 1994, a number of frequency distributions and cross-tabulations of minority status with other relevant dimensions such as service, paygrade, and occupation were generated and examined. Selected results are discussed in Chapter IV and tables are presented in Appendix A. Two restrictions were placed on the officer samples before

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generating the frequency tables. First, Warrant Officers were omitted from the analysis because of extreme differences across services and between commissioned officers in qualifications, accession, and utilization. Second, observations were omitted when gender was not identifiable within the data. Observations with an undetermined racial background were left in the data set and cross-tabulated as a separate "unknown" category. Table I below indicates the total number of observations remaining after these restrictions were imposed on the samples for each of the eight years examined.

Table 1. Observations in Cross-Sectional Analysis, by Fiscal Year, 1987-1994

Year	Number of Observations	Year	Number of Observations
1987	288,300	1991	271,050
1988	285,431	1992	255,240
1989	283,531	1993	239,176
1990	277,224	1994	228,495

2. Minority Status, Rank, and Service

Appendix Tables A1-A16 depict the trend in minority officer representation for each service and total DoD for 1987 through 1994. All officers O-1 through O-10 are presented first, followed by separate tables for O-4s, O-6s, and flag or general officers. Minorities are divided into four categories: black, Hispanic, Asian/Pacific Islander, and all other minorities (including American Indian/Eskimo). These race and ethnicity categories are used throughout this analysis.

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3. Minority Status, Occupation, and Service

Previous research has indicated that minorities are not proportionally represented across occupations (Eitelberg, 1988). Appendix Tables A17-A25 present black representation in each service and total DoD for each of the nine general occupational categories delineated for officers in the DoD Occupational Conversion Index, dated September 1993. Table 2 below describes these occupational categories.

Table 2. DoD Occupational Categories

Number	DoD Occupational Category
1	General Officers and Executives, N.E.C.
2	Tactical Operations Officers
3	Intelligence Officers
4	Engineering and Maintenance Officers
5	Scientists and Professionals
6	Health Care Officers
7	Administrators
8	Supply, Procurement, and Allied Officers
9	Non-Occupational Officers

Source: DoD 1312.1-1 Occupational Conversion Index

Realizing that occupation plays such an important role when discussing racial representation in the military, it is important to examine the trends in the occupational mix throughout the downsizing period. Presumably, if jobs within certain occupations are eliminated faster than others, minorities may be disproportionately affected due to differences in occupational representation. Appendix Tables A26-A30 depict the trends in occupational mix for DoD and each service, using the occupational categories outlined in Table 2. The base year for all occupational comparisons is 1988,

due to apparent discrepancies in the data for 1987 with respect to occupation.

B. LONGITUDINAL ANALYSIS

In the second part of the analysis in this thesis, four entering cohorts--1977, 1980, 1983, and 1987--were used to model separation behavior both prior to and during the drawdown. The cohorts included officers who were commissioned as O-1s between October 1st and September 30th of the years examined. As mentioned in Chapter II, since there is little difference theoretically and empirically between employees who "quit" and employees who are "fired," no distinction was made between officers who left voluntarily, and those who left involuntarily.

Before models could be developed and interpreted, a significant problem was encountered in identifying the proper time horizon(s) to examine with respect to probability of separation. As mentioned in Chapter II, officers do not have an explicit "enlistment" contract that would force a decision point at the expiration of that contract. Consequently, the services use the expiration of minimum service requirement (MSR) as a basis for measuring retention. The minimum service data in the DMDC files, however, proved to be unreliable. Since the multivariate models appeared to be sensitive to the selected time horizon over which retention is measured, it was necessary to develop some logical framework for choosing the time period for the retention decision. The sections below describe the methodology used to determine appropriate time horizons, and also the multivariate models used to analyze separation behavior.

1. Identification of Separation Phases

In attempting to identify appropriate time horizons for analysis, the separation probability density function ("death" or "non-survival" density function) for each year-group was

plotted, by service. These plots, representing the probability that a randomly selected individual will separate at any given time (t), are presented in Appendix B (Figures 1-16).

Examination of these probability density functions, revealed that officer separation could be divided into distinct career phases. The first phase generally occurs between zero and three years of service and is called the attrition phase. The second phase falls between three and approximately 10-11 years of service and is called the early leave decision phase. It is in this phase that the minimum service requirements expire, as evidenced by increased separation probability at four, five, and six years of commissioned service. The next phase appears to be much narrower in time and falls between 10-14, years of service depending upon branch. It is presumed that this phase is highly correlated with promotion to O-4. Evidence for this can be found in that the Navy career decision phase falls between 9 and 12 years of service, earlier than in the Army and Marine Corps. The Navy has also historically promoted officers to O-4 sooner than the Army and the Marine Corps. The fourth phase, termed the late leave decision phase, coincides with the remainder of an officer's career after the career decision phase. In the 1977 cohort, an additional phase was identified after 15 years of service and is associated with the 15-year retirement or TERA program. For simplicity, these phases are numbered and I through V, according to Table 3 below, and subsequently referred to by number.

The figures presented in Appendix B also indicate which of these phases fell partially or completely within the drawdown years. For the Army, Air Force, and Marine Corps, 1988 was used as the beginning of the drawdown period. For the Navy, 1989 was used because the Navy began its downsizing

later than the other services. This delineation of pre-drawdown and drawdown years is useful in comparing the separation phases between year groups, when differing policies and programs were in effect. The sections below briefly describe the separation probability density functions for each service.

a. Army Separation Phases

Figures 1-4 in Appendix B present the separation probability density functions for the four Army cohorts. In the 1977 Army cohort, the attrition phase was abbreviated to less than two years, compared with approximately three years for the other cohorts. The career decision phase appeared to begin around 11 years of commissioned service for those cohorts where this phase was observable. A period of slightly increased separation probability is observed after 15 years of service in the 1977 cohort and is presumably correlated with the 15-year retirement.

Table 3. Phases of Officer Separation Behavior

Number	Phase
I	Attrition
II	Early Leave Decision
III	Career Decision
IV	Late Leave Decision
V	Early Retirement Window 1977 Cohort only

b. Navy Separation Phases

Figures 5-8 in Appendix B depict the separation probabilities for the four entering Navy cohorts. The patterns here are similar to those of the Army, with some notable exceptions. The 1977 Navy attrition phase lasted until the third year of service, instead of only two years.

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The career decision phase for Navy officers appears to begin just prior to the tenth year of service, supporting the notion that this phase is closely tied with promotion to O-4. The early retirement phase is much more accentuated in the 1977 Navy cohort, especially around 17-18 years of service.

c. Air Force Separation Phases

Figures 9-12 in Appendix B present the separation probability density functions for the Air Force officer cohorts. These plots are similar to the Navy plots described above. Notably different is the probability of separation at the four-year point relative to separation later in the early decision phase. The Air Force seemed to experience more disruption of the "normal" separation pattern, through the drawdown, than was witnessed in the Army and Navy, making it difficult to identify the career decision phase in the 1983 cohort. In the 1977 and 1980 cohorts the career decision phase appeared to begin at around to ten years of service; in the 1983 cohort, however, it appeared to occur earlier, at approximately nine years. Due to this finding, an additional late decision phase was model for the 1983 Air Force cohort.

d. Marine Corps Separation Phases

Figures 13-16 in Appendix B present the separation probability density functions for the Marine cohorts. The most significant differences between these cohorts and those of the other services are the very low probabilities of separating in the attrition phase and the timing of the career decision phase. The career decision phase did not begin until approximately 12 years of service for the 1977 and 1980 Marine year groups. Additionally, there was no discernible increase in separation probability during the early retirement window identified in the other services.

2. Multivariate Separation Models

Once the phases of separation were identified for each cohort by service, multivariate models were developed and estimated for each phase independent of other phases. That is, separation behavior was modeled for each phase conditional upon having survived to the beginning of the phase being modeled. Modeling in this way eliminates the cumulative effects of separation in previous phases. Once the models were estimated, comparisons were made between like phases that occurred before the drawdown with those that occurred during the drawdown.

Log-likelihood ratio tests were conducted to determine if behavior in the pre-drawdown phases were statistically different from behavior in that in the drawdown phases. In every case, the tests indicated that the models of the pre-drawdown phases were significantly different from those estimated during the drawdown. This fact does not directly prove that drawdown policies were the cause of differences in separation behavior, only that observed behavior was statistically different.

Two types of models were used to assess the impact of personal characteristics on separation probability: a log-linear survival model and a "logit" regression model. The sections below describe the attributes of these models, as well as the dependent and explanatory variables used.

a. *Log-Linear Survival Model*

The log-linear survival regression model assumes that the natural logarithm of survival time (t), in this case, months of commissioned service until separation, is a linear function of the explanatory variables. However, due to the presence of right-censored observations and the probability that log(t) is not normally distributed, ordinary-least-squares regression techniques are inappropriate. For these . reasons, an accelerated life model employing the method of maximum likelihood is used to obtain the parameter estimates.

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Additionally, a Weibull distribution of log(t) is assumed. This assumption can be checked by examining the plot of the log(-log S(t)) of the sample, where S(t) is the survival function. If this plot is approximately linear, then the Weibull distribution can be assumed. (Afifi and Clark, 1990)

Thus, for these separation models the log of months of commissioned service until separation was regressed on the explanatory variables. In the samples used for this analysis, the Weibull distribution is appropriate. Right censored observations, those officers surviving past the end of the phase in question, are accounted for. The parameter estimate obtained by this model can be directly interpreted as a proportional or relative change in months of commissioned service until separation, given an absolute change in the explanatory variable, holding other variables constant. By multiplying the parameter estimate by 100, the percentage change in the dependent variable, holding other explanatory variables constant, is obtained (Gujarati, 1988). The explanatory variables used in these models are described in section c, below.

b. *Non-Linear Logit Regression Model*

A second method of modeling separation behavior is simply to divide the observations into two categories: those who separated during a given career phase and those who did not. When the dependent variable is specified in this manner, logit regression is appropriate. The basic assumption in this technique is that the log(odds) of belonging to a population is related to the explanatory variables. No assumptions are made regarding the distribution of the explanatory variables, allowing these to be either discrete or continuous (Afifi and Clark, 1990). Thus, in terms of probability of separating, the logit model as:

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$$Separation\ Probability = \frac{1}{1+\exp(-(\beta_0+\beta_iX_i+\epsilon_i))}$$

where the β's are the logit parameter estimates, the X_i's are the explanatory variables, and ϵ_i is the stochastic error term. The parameter estimates are interpreted as the change in the log(of the odds) of the dependent variable, given a one-unit change in the dependent variable, holding all other explanatory variables constant. In the models presented in Appendix C, this change in the log(of the odds) is converted to an absolute change in probability as well as a percentage change in probability. Section c below describes the explanatory variables used with the logistic regression models.

c. Explanatory Variables for Separation Models

For purposes of comparison, the same specification of explanatory variables was used, where possible, in all models. Table 4, below, lists and briefly describes the variables used.

The minority variables, BLACK, HISPANIC, OTHMINOR, and ASIAN/PI are of primary interest to this analysis. There are two opposite *a priori* hypotheses in relation to the impact of minority status on separation behavior. The first is that the military is generally perceived to have a better equal opportunity atmosphere and to offer better employment opportunities and pay than the civilian sector; and, consequently, minorities would be less likely leave (as is generally thought to be the case in the enlisted ranks). The alternative hypothesis is that these highly-qualified (college graduate) minorities are in high demand in the civilian sector, thus making them more likely to leave the military, especially if they perceive that long-term career opportunities in the military are not as favorable as they may have believed upon being commissioned.

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The FEMALE variable is included to capture differences in separation behavior between genders. Generally, women are expected to have higher turnover rates than men (Ehrenberg and Smith, 1994) and are thus expected to have a higher probability of separation in this analysis, at least in the early career phases. The NUMDEPS variable is included to capture the risk aversion and lower job mobility expected of officers with larger families. Thus, this variable is expected to decrease the probability of separation.

Table 4. Description of Explanatory Variables

Variable	Description
BLACK	coded 1 if black, 0 otherwise
HISPANIC	coded 1 if Hispanic, 0 otherwise
OTHMINOR	coded 1 if Other minority, 0 otherwise
ASIAN/PI	coded 1 if Asian/Pacific Islander, 0 otherwise
FEMALE	coded 1 if female, 0 if male
NUMDEPS	continuous variable for number of dependents
ENLSVC	coded 1 if prior enlisted service, 0 otherwise
ENTRYAGE	continuous variable for age at service entry
ACAD	coded 1 if an academy graduate, 0 otherwise,
POSTGRAD	coded 1 if held a Master's or higher degree, 0 otherwise
NODEG	coded 1 if no college degree, 0 otherwise
OPERATNL	coded 1 if a Tactical Operations Officer, 0 otherwise

Economic theory implies that older persons have more experience and are thus more likely to obtain a job-match when seeking employment. Thus, the ENTRYAGE variable is expected to decrease the probability of separation. In a study of enlisted attrition, however, Buddin (1984) found the opposite,

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and argued that the military may tend to attract "labor market lemons," thus increasing separation rates for older persons.

The ENLSVC variable is expected to have a negative impact on separation in earlier years, because persons with prior enlisted service have demonstrated a propensity for military service and have already accumulated time toward retirement. In later years, they are expected to leave at higher rates as they reach retirement eligibility sooner than their peers without prior service.

Similarly, academy graduates are predicted to stay longer than those from other commissioning sources due to a demonstrated higher propensity for military service, as well as the acculturation received during their tenure at the academy. The ACAD variable, then, should show a decrease in separation probability.

Two education variables are included, POSTGRAD and NODEG. The *a priori* hypothesis concerning these variables is that education enhances the attainment of firm-specific human capital, thus decreasing turnover rates. NODEG, then, should increase separation, while POSTGRAD would decrease separation relative to those with only an undergraduate degree.

The final variable, OPERATNL, captures the differences between those categorized as Tactical Operations Officers and all others. *A priori* assumptions concerning this variable are somewhat mixed, and may vary among services. For example, inclusion into this category in the Navy would infer a greater time spent on sea duty, which might increase separation rates. At the same time, this occupational group might have greater (or lesser) promotion opportunities which, presumably, affect separation decisions.

Thus, with all these variables included, the dependent variables described in above sections, are considered to be related to race, gender, number of dependents, prior enlisted service, age at entry, source of commission, education, and

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occupation. The base case for these models would then be a white, male, non-prior service, non-academy graduate, with an undergraduate degree (only), and of any occupation except Tactical Operations.

This chapter has outlined the methodology used to examine minority officer retention/separation throughout the drawdown. Chapter IV presents the results of the cross-sectional and longitudinal analyses.

IV. RESULTS

This chapter discusses the results of the cross-sectional and longitudinal analyses described in Chapter III. The results from the VSI/SSB models are contained in Chapter V.

A. CROSS-SECTIONAL ANALYSIS

Appendix A presents selected results from the various cross-tabulations that examine trends in minority officer representation throughout the drawdown. Minority representation for paygrades O-1 through O-10 can be found in Appendix Tables A1-A4. Appendix Tables A5-A16 present representation figures for O-4s, O-6s, and Flag/General officers, separately. Black officer representation by occupation is presented in Appendix Tables A17-A25, while Tables A26-A30 show trends in occupational mix by service. The contents of these tables are discussed below.

1. Rank and Representation

For paygrades O-1 through O-10, modest gains in representation were seen for minority groups with only a few exceptions. DoD-wide, black officer representation increased from 6.5 to 7.2 percent, with the Navy showing the largest percentage point increase. The Navy was also the only service to actually increase the number of black officers through the drawdown, but still has one of the lowest proportions at 4.9 percent. Hispanic representation increased from 1.7 to 2.6 percent DoD-wide, with all services showing a percentage point increase except the Air Force, where Hispanic representation remained virtually constant. Asian/Pacific Islander representation increased from 1.4 to 2.1 percent, while all other minority groups combined increased slightly from 1.2 to 1.6 percent DoD-wide.

Among black O-4s, the Army and Air Force showed dramatic increases of 4.8 and 3.4 percentage points, respectively. The

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Navy posted a much more modest gain of 0.6 percentage points, while the Marine Corps remained constant. Hispanic O-4 representation increased from approximately 1.0 to 1.5 percentage points across all services, and was at 2.6 percent DoD-wide at the end of 1994. Asian/Pacific Islander O-4 representation increased from 1.0 to 1.8 percent, while all other minorities showed a slight increase of 0.2 percentage points DoD-wide.

Among O-6s and flag or general officers, the increases in minority representation were much smaller. The Marine Corps posted a significant increase in black O-6s of 1.8 percentage points. The Air Force had the largest increases in representation among general officers of 1.8 percentage points for blacks, 1.4 percentage points for Hispanics, and 1.7 percentage points for the other minority category.

2. Black Officers and Occupation

Given the apparent importance of occupational assignment in matters of representation, the occupational distribution of the largest minority group, blacks, was examined through the drawdown. Appendix Tables A17 through A25 show the number and percentage of blacks within the nine DoD occupational categories described in Chapter III. Although there are large differences across services, it is significant to note that black representation is generally low in the Tactical Operations category, while generally high in the Administrators and Supply, Procurement, and Allied categories. The significance of this finding is discussed in the next section concerning trends in occupational mix throughout the drawdown.

3. Trends in Occupational Mix

One major concern throughout the drawdown has been that minorities may be adversely affected by reductions due to differential effects among occupations. Appendix Tables A26 through A30 show the percentage distribution in occupational

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mix for DoD and for each of the services. The occupation with the largest decrease, especially in the Army and Air Force, is the Tactical Operations category. This is also the category in which blacks have the lowest representation. The categories where blacks are most highly represented—Administrators, and Supply, Procurement, and Allied Officers—showed smaller declines or even increases. Consequently, had all other things been equal, this effect alone would have increased the percentage of black officers throughout this period. The effect is compounded by the fact that the Army and Air Force have the highest black representation in DoD, and these two services experienced the most pronounced occupational shifts favoring blacks. Further evidence of this effect is found in Appendix Table A1, where the number of black officers actually peaked in 1990 for the Air Force and 1991 for the Army, yet the percentage of black officers continued to increase throughout the entire period.

B. RESULTS OF MULTIVARIATE MODELS

Appendix C contains the results of the log-linear survival and logit separation models described in Chapter III. The findings from these models are summarized below. Due to the small numbers of minorities in many of the samples modeled, statistical significance is measured at the .20 level for the discussion below. Higher levels of significance can be determined by comparing the chi-square and Wald chi-square values with the critical values listed at the beginning of Appendix C. The means of the variables, the sample size, as well as the number of leavers during the phase are contained within the table for each model. Additionally, log likelihood ratio tests, model chi-squares, and concordant ratios are presented to indicate goodness-of-fit of each model.

It was desirable to model the effects of the minority status variables separately, in attempting to understand

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differences in separation behavior among the minority groups. Because the models were specified in this manner, statistical significance was not achieved in many cases for minorities other than blacks. For this reason, the discussion below centers primarily on black officer separation probabilities.

1. Log-linear Survival Versus Logit Separation Models

The log-linear survival and logit separation models differ in the dependent variable that is regressed on the explanatory variables. The log-linear models uses the log(of the months of commissioned service until separation as the dependent variable). Thus, the parameter estimates can be interpreted as a relative change in months of commissioned service given an absolute change in the explanatory variable, The log-linear regression equation can be used to estimate typical survival times for selected cases. Since the dependent variable is a natural logarithm, exponentiating the sum of the parameters plus the intercept for the desired case will yield survival time. By setting all dummy explanatory variables in the model to zero and assuming the continuous explanatory variables to be at the mean, exponentiating the intercept will yield the expected survival time of the base case. Then, by setting desired dummy explanatory variables to one and exponentiating the sum of the right-hand side of the equation will yield the expected survival time of the case in question. (Afifi and Clark, 1990)

The logit separation models yield parameter estimates that reflect the change in the log(of the odds) of separating during the phase. This is more readily interpreted by multiplying the parameter by $P(1-P)$, where P is the base probability of leaving during the phase (leavers divided by sample size). This conversion yields a direct change in probability given a one unit change in the explanatory variable. Thus, the BLACK variable in the 1977 Army attrition

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phase logit model, with a parameter estimate of 0.3883, can be interpreted as a 0.0085 absolute increase constant.

Since the focus of this thesis is to identify general trends in minority separation behavior relative to non-minorities, the discussion below focuses primarily on the logit separation models, which yield simply an increase or decrease in separation probability. For ease of reference, Tables 5 through 8, at the end of this chapter, present a summary of results for black and Hispanic officers for each cohort, by service and phase. The tables present the parameter estimates for the log-linear models, and the absolute change in separation probability for the logit separation models.

2. Army Model Results

Examination of the Army separation models revealed an interesting pattern of black officer separation. Black officers were much more likely than whites to leave during the attrition phase (Phase I) for all years. In the 1977, 1980, and 1987 cohorts, however, black officers became less likely to leave than their white counterparts during the early leave decision phase (Phase II). At the career decision phase, black officers who entered in 1977 were again much more likely to leave than whites. In the 1980 cohort, which reached the career decision point at the height of the drawdown, black officers were less likely to leave than whites. In the 1983 cohort, black separation behavior had returned to the 1977 pattern. Additionally, black officers of the 1977 cohort were more likely to separate during the early retirement eligibility phase.

Due to the lack of statistical significance, little can be said concerning trends in separation behavior of other minority groups or of women. Age at entry into the service appeared to have a large effect upon separation probability. The older a person was upon commissioning, the more likely he

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or she was to separate. In general, academy graduates and officers holding advanced degrees were less likely to separate. Officers in tactical operations were generally less likely to separate than officers in other occupations, except in the 1987 cohort, where they were more likely to separate during each of the three phases examined.

3. Navy Model Results

Black officer separation patterns in the Navy were very similar to those found in the Army. Blacks had a very high probability of leaving during the attrition phase (Phase I) of all four cohorts compared with whites. Following the 1977 cohort, blacks in the early decision phase (Phase II) were not statistically different from whites. However, during the career phase (Phase III), blacks once again became much more likely to leave than whites. There was no significant difference between whites and blacks in the late decision or early retirement phases for the 1977 year group.

The 1980 and 1983 year groups differed from the 1977 cohort in that there was no difference statistically between white and black separation during the career phases (Phase III) for these two cohorts. It is important to note that the career phase for the 1980 and 1983 cohorts occurred during the drawdown years, while it occurred just prior to the drawdown for the 1977 cohort. Contrary to a *priori* hypotheses, women were generally no different than men in their separation probability, and where significant differences did exist, women were less likely to leave.

In general, the other explanatory variables had similar effects as in the Army. Age-at-entry increased one's separation probability, at least in the earlier career phase, while academy graduates, those with advanced degrees, and those in operational occupations were less likely to leave. Officers in the operational occupations were, however, significantly more likely to separate during the career

decision phase for the 1983 cohort only. This phase occurred at the height of the drawdown for the Navy, and may be associated with the VSI/SSB offerings in 1993 and 1994.

4. Air Force Model Results

The pattern of black separation behavior established in the earlier discussions of the Navy and the Army was even more pronounced in the Air Force. Black officers demonstrated a much higher propensity to leave in the attrition phases (Phase 1), while showing a much lower separation probability in the early decision phases (Phase II) for the 1977, 1980, and 1983 year groups. The 1987 cohort is somewhat of an anomaly in that there was no statistical difference between whites and blacks in either phase examined. Blacks were also more likely to leave during the early retirement phase (Phase V) than whites for the 1977 cohort.

The career phases (Phase III) of the 1977, 1980, and 1983 cohorts provide an interesting comparison. In the 1977 cohort, blacks showed a much higher probability of leaving (0.1381 or 68 percent). In the 1980 cohort, this phenomenon was reversed with blacks 49 percent less likely to separate. The 1983 cohort, which reached the career decision phase much later in the period examined, blacks were 28.3 percent more likely to separate than whites. This pattern is very similar to what was seen in the Army career decision phases.

There are at least two possible explanations for this pattern of behavior. The first is that, since the Army and the Air Force entered the drawdown earlier than the Navy, the effects of newly implemented drawdown policies wore off sooner, and separation behavior has begun to return to pre-drawdown (1977 cohort) patterns. The second explanation is that the career phases might have been incorrectly identified due to the downsizing induced disruption of the "normal" cohort behavior. It is important to remember that the Navy, which entered the drawdown later, had no significant

difference in the separation behavior of whites and blacks at the career phase for the 1983 cohort.

Women in the Air Force demonstrated greater differences compared with men than in the other services. Women were generally more likely to separate during the early leave decision phases of all cohorts. Women were more likely to leave than men during the attrition phase of the 1977 cohort; but, in the 1983 and 1987 cohorts, this finding was reversed. In the later career phases, women were typically more likely to stay than men.

Other explanatory variables had similar effects to what was found in the other services. Graduate education seemed to have a particularly strong effect in the Air Force. Once again, those categorized as tactical operations officers were less likely to separate during most phases.

5. Marine Corps Model Results

Little can be said concerning trends in minority separation behavior in the Marine Corps due to the small number of officers modeled in each phase and the consequent lack of statistical significance. Blacks were significantly more likely to leave during the career decision phases (Phase III) of 1977 and 1980. Similarly, they were more likely than whites to separate during the attrition and early leave decision phases of the 1983 and 1987 cohorts.

6. Summary of Model Results

A general pattern of separation appears evident among black officers for the time period examined in this research. Prior to the drawdown, blacks tended to have high early attrition rates compared with whites, but low or at least decreased separation probabilities in the early decision phase (from three to ten years of service). At the career decision point, assumed to be associated with promotion to O-4, blacks again showed a higher probability of separating. This tendency (of higher separation during the career phase)

appeared to decrease during the drawdown, but may have re-emerged in later cohorts. In two of the four services, blacks had a significantly higher probability of leaving than whites in the early retirement window present in the 1977 cohort. In the other two services, there was no statistical difference between whites and blacks in the early retirement window.

Table 5. Summary of Log-linear Parameter Estimates and Changes in Separation Probability for Black and Hispanic Officers by Service and by Career Phase--1977 Cohorts

Service	Career Phase	Black Officers		Hispanic Officers	
		Log-lin Estimate[1]	δ Prob of Sep[2]	Log-lin Estimate[1]	δ Prob of Sep[2]
Army	I	-1.1452*	0.0085*	-2.6361*	0.0252*
	II	0.1551*	-0.0746*	-0.1953*	0.0285
	III	-0.1942*	0.0617*	0.0049	-0.0044
	IV	0.1160	-0.0102	0.1175	-0.0117
	V	-0.1057*	0.0417*	-0.1066	0.0441
Navy	I	-1.5139*	0.0195*	1.6176	-0.0215
	II	-0.2452*	0.0547*	0.0158	-0.0259
	III	-0.3774*	0.01025*	-0.0959	0.0444
	IV	-0.1771	0.0398	0.5929*	-0.1744
	V	-0.1226*	0.0794	0.0815	-0.0473
Air Force	I	-2.1173*	0.0343*	-0.7745	0.0208
	II	0.1944*	-0.0777*	0.1480	-0.0409
	III	-0.4469*	0.1381*	0.0652	-0.0250
	IV	0.0602	-0.0186	-0.0019	-0.0115
	V	-0.1337*	0.0798*	-0.0551	0.0359
Marines	I	0.8532	-0.0399	-1.9091*	0.0602*
	II	-0.1561	0.0294	-0.5879*	0.2224*
	III	-0.6830*	0.2526*	-0.2516	0.1085
	IV	-0.0088	-0.0141	--------	-------

[1]The parameter estimate from the log-linear survival models in Appendix C.

[2]The change in separation probability compared to whites.

*Statistically significant at the .20 level (or higher).

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Table 6. Summary of Log-linear Parameter Estimates and Changes in Separation Probability for Black and Hispanic Officers by Service and by Career Phase--1980 Cohorts

		Black Officers		Hispanic Officers	
Service	Career Phase	Log-lin estimate[1]	δ Prob of Sep[2]	Log-lin estimate	δ Prob of Sep[2]
Army	I	-0.9133*	0.0258*	-0.0513	-0.0003
	II	0.3568*	-0.1079*	-0.3706	0.1671*
	III	0.0436	-0.0178	0.0796	-0.0487
	IV	0.0215	0.0003	-0.3737	0.0133
Navy	I	-2.0186*	0.0371*	-1.6354*	0.0286*
	II	-0.0418	0.0226	0.2183	-0.1165*
	III	0.0950	-0.0133	-0.2890*	0.0960*
	IV	0.1858	-0.0440	0.3717	-0.0915
Air Force	I	-0.6065*	0.0117*	3.3364*	-0.0566*
	II	0.2537*	-0.0704*	-0.0366	-0.0017
	III	0.3293*	-0.0627*	0.0086	-0.0038
	IV	0.0411	-0.0180	-0.0349	0.0220
Marines	I	1.1441	-0.0162	41.9423	--------
	II	-0.0767	-0.0209	-0.0644	0.0161
	III	-0.3609*	0.1254	-0.2260	0.0877
	IV	-0.7010	0.0714	11.3803	--------

[1]The parameter estimate from the log-linear survival models in Appendix C.
[2]The change in separation probability compared to whites.
*Statistically significant at the .20 level (or higher).

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Table 7. Summary of Log-linear Parameter Estimates and Changes in Separation Probability for Black and Hispanic Officers by Service and by Career Phase--1983 Cohorts

		Black Officers		Hispanic Officers	
Service	Career Phase	Log-lin estimate[1]	δ Prob of Sep[2]	Log-lin estimate	δ Prob of Sep[2]
Army	I	-1.0335*	0.0269*	0.9507	-0.0273
	II	-0.0458	0.0315*	-0.0102	0.0182
	III	-0.1694*	0.0564*	-0.3922	0.1422
Navy	I	-1.3818*	0.0379*	-2.1948*	0.0591*
	II	0.0989	-0.0274	-0.1883*	0.0340
	III	-0.0733	0.0149	-0.4122*	0.0931*
Air Force	I	-1.6457*	0.0328*	0.0393	-0.0024
	II	0.3222*	-.1154*	0.0525	-0.0400
	III	-0.2217*	0.0562*	-0.4128*	0.0891*
	IV[3]	-0.0050	-0.0018	-0.7591*	0.0371*
Marines	I	-2.0286*	0.0337*	0.6541	-0.0127
	II	-0.4048*	0.1644*	-0.3529*	0.1487*
	III	-0.3150	0.0822	15.7442	--------

[1]The parameter estimate from the log-linear survival models in Appendix C.
[2]The change in separation probability compared to whites.
[3]An additional Late Decision Phase was identified in the 1983 Air Force cohort (see Appendix B, Figure 11).
*Statistically significant at the .20 level (or higher).

Table 8.   Summary of Log-linear Parameter Estimates and Changes in Separation Probability for Black and Hispanic Officers by Service and by Career Phase--1987 Cohorts

		Black Officers		Hispanic Officers	
Service	Career Phase	Log-lin estimate[1]	δ Prob of Sep[2]	Log-lin estimate	δ Prob of Sep[2]
Army	I	-0.4410	0.0134*	-1.3457*	0.0322*
	II	0.3184*	-0.0750*	-0.0809	0.0235
Navy	I	-1.5781*	0.0309*	-2.3750*	0.0579*
	II	0.1223	-0.0333	0.3002*	-0.0911*
Air Force	I	0.1156	0.0020	-1.8954*	0.0415*
	II	0.1388	-0.0239	0.1965	-0.0196
Marines	I	-2.1822*	0.0177*	-1.6252	0.0147
	II	-0.4034*	0.1491*	0.0165	0.0631

[1]The parameter estimate from the log-linear survival models in Appendix C.
[2]The change in separation probability compared to whites.
*Statistically significant at the .20 level (or higher).

V. VSI/SSB SEPARATION INCENTIVE MODELS

In the final part of this analysis, VSI/SSB data files from the Air Force (1992 and 1993) and the Navy (1993) were examined. These files were constructed by DMDC to include only those eligible to receive the early separation incentives during the fiscal year that the program was offered. Each fiscal year was modeled separately, due to the fact that the incentives were targeted to certain populations that varied by service and by year. The sections below describe the model specification used to analyze the probability of acceptance of VSI/SSB.

A. VSI/SSB MODEL SPECIFICATION

The logit regression models used to examine acceptance of VSI/SSB are very similar to the logit models used to evaluate separation in the Chapters III and IV. In this case, the probability of separating under the VSI/SSB program is modeled as a function of race, gender, age, number of dependents, source of commission, rank, education, years of service, months in grade, and occupation.

Table 9 presents a list and brief description of the explanatory variables used in the VSI/SSB models. Again, the race variables--BLACK, HISPANIC, ASIAN/PI, and OTHMINOR--are the primary focus of this analysis. The variable FEMALE is expected to indicate a higher probability of separation, while NUMDEPS is predicted to indicate a lower acceptance rate.

The years of service variable, YOS, is expected to be associated with a lower acceptance probability, due to the fact that individuals with higher years of service are much closer to retirement. Additionally, this variable captures the impact of prior enlisted service, which, of course, counts toward retirement eligibility. Thus, those with more service time have a much higher cost-of-leaving due to the large

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potential loss of retirement benefits. The months in grade variable, MIG, is included, based on the notion that those who are slower to be promoted might be more likely to leave the military in search of more suitable employment. Thus,

Table 9. Description of Explanatory Variables for VSI/SSB Models

Variable	Description
BLACK	coded 1 if black, 0 otherwise
HISPANIC	coded 1 if Hispanic, 0 otherwise
ASIAN/PI	coded 1 if Asian/Pacific Islander, 0 otherwise
OTHMINOR	coded 1 if other minority, 0 otherwise
FEMALE	coded 1 if female, 0 if male
AGE	continuous variable for age
YOS	continuous variable for years of service
MIG	continuous variable for months in grade
NUMDEPS	continuous variable for number of dependents
ACAD	coded 1 if an academy graduate, 0 otherwise
LTJG, LCDR, FIRSTLT, MAJOR, LTCOL	dummy variables for rank dependent upon paygrade and service
POSTGRAD	coded 1 if held a Master's or higher degree, 0 otherwise
OPERATNL	coded 1 if a Tactical Operations Officer, 0 otherwise

officers with more months in grade are predicted to accept VSI/SSB at a higher rate. Among the rank variables, LTJG, LCDR, FIRSTLT, MAJOR, and LTCOL, (O-3, Air Force Captain and

Navy Lieutenant is the omitted category) it is expected that officers with lower ranks would be more likely to accept the separation incentive, again because they would be farther from retirement eligibility. Additionally, the lower rank would indicate a lesser accumulation of firm-specific human capital. The variables POSTGRAD and OPERATNL are predicted to have similar effects as in the earlier models, namely a lower separation probability for POSTGRAD, and an undetermined effect for the OPERATNL variable.

B. VSI/SSB MODEL RESULTS

The sections below summarize the results from the VSI/SSB models. Each incentive offering was modeled separately (by service and fiscal year) due to differences in the targeted populations.

1. Air Force FY 1992 VSI/SSB Offering

Table 10 presents the results of the logit model for the VSI/SSB incentive offered to Air Force Officers in 1992. In this population of 12,167 eligibles (observations with missing data were deleted), 2,324 officers accepted the incentive for a take-rate of 19.10 percent (9 percent VSI/10.1 percent SSB).

Examination of the parameter estimates indicates that black officers were significantly less likely to accept the incentive than were whites. Although the signs of the estimates for all other minority groups were negative, there was no statistical difference between those groups and whites.

Among the other variables, women were much more likely to accept the separation bonus than were men, while Air Force officers with a greater number of dependents were slightly more likely to take the bonus than were those with smaller families. Years of service had a negative effect on acceptance as did graduate education and being a tactical operations officer. Compared with O-3s, O-2s and O-5s were less likely to accept the bonus, while O-4s were more likely.

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2. Air Force FY 1993 VSI/SSB Offering

Table 11 presents the results of the second fiscal year that VSI/SSB was offered to Air Force officers. As seen in Table 6, the population that this incentive was offered to was almost double in size to that of the previous year. Of 23,036 eligibles, 2,693 accepted for a take-rate of 11.7 percent. Again, more takers opted for VSI (6.3 percent) than for SSB (5.4 percent). Note that there is a potential truncation problem in this sample. Since 2,324 officers accepted the offer (out of 12,167 who were eligible) in the previous year, they selected themselves out of the 1993 sample. Thus, the eligible population is no longer randomly selected and the estimated coefficients will tend to be biased.

In this population, blacks and Asian/Pacific Islanders were more likely to accept the incentive (significant only at the .20 level). There was no difference statistically for women, Hispanics, and other minorities. The difference between these results and that for 1992 may be due to sample truncation.

Years of service, again, had a strong negative impact on acceptance, as did holding a graduate degree and being an academy alumnus. Majors and Lieutenant Colonels were both less likely to separate under the bonus than were Captains. There were no O-2s in this eligible population. Months in grade was statistically significant and indicated an increase in separation probability under the bonus.

3. Navy FY 1993 VSI/SSB Offering

The Navy did not offer VSI/SSB to its officers until 1993. Table 12 below depicts the results of the logit regression model on the Navy incentive program. Of 14,879 eligibles (after observations with missing data were deleted), 853 accepted for a take-rate of only 5.7 percent. In the Navy, a larger number opted for the SSB incentive (3.6 percent) than for VSI (2.1 percent).

The parameter estimates indicate that all minorities took the incentive at a lower rate than did whites, but only the coefficients for Hispanics and Asian/Pacific Islanders reached statistical significance. As in the first year of the Air Force offering, women were much more likely to accept the bonus than were men.

Naval officers with high years of service and an advanced degree were much less likely to accept the incentives than those with lower years of service or with only an undergraduate degree. Behavior of officers categorized in tactical operations more closely mirrored the 1993 Air Force population by showing an increased probability of acceptance. Lieutenants (Junior Grade) and Lieutenant Commanders were significantly less likely to take the incentive than were Lieutenants (O-3s).

4. Summary of VSI/SSB Models

It is probably most appropriate to compare the 1992 Air Force results with the 1993 Navy results, since those are the years that the separation incentives were first offered within the respective services. Among these two populations, minorities were generally less likely to accept, while women were more likely to accept. In the 1993 Air Force population, however, minorities were somewhat more likely to take the separation incentive, probably owing to the truncation issue.

As expected, the models revealed that years of service, advanced education, occupation, and rank were significant predictors of accepting the bonus. Although statistically significant, months in grade was of little practical significance. Academy graduates demonstrated a significantly lower probability of acceptance only in the 1993 Air force population.

Table 10. 1992 Air Force VSI/SSB Acceptance Model

Variable	Mean	Logistic Regression Model				
		β	Wald χ^2	Pr > χ^2	$\delta P/\delta X$	% δP
BLACK	0.0695	−0.4567	22.0795	0.0001	−0.0706	−36.9
HISPANIC	0.0250	−0.0104	0.0048	0.9450	−0.0016	−0.8
OTHMINOR	0.0118	−0.0995	0.1843	0.6677	−0.0154	−8.0
ASIAN/PI	0.0162	−0.0566	0.0964	0.7562	−0.0087	−4.6
FEMALE	0.0946	0.6918	83.0869	0.0001	0.1069	56.0
AGE	35.0577	−0.0538	26.2741	0.0001	−0.0083	−4.4
YOS	12.6917	−0.0984	89.1288	0.0001	−0.0152	−8.0
MIG	48.9856	0.0000	0.0008	0.9770	0.0000	0.0
NUMDEPS	3.2385	0.0724	17.0912	0.0001	0.0112	5.9
ACAD	0.1006	−0.0588	0.4533	0.5008	−0.0091	−4.8
POSTGRAD	0.5163	−0.1897	12.4537	0.0004	−0.0293	−15.3
OPERATNL	0.4089	−0.8765	243.855	0.0001	−0.1354	−70.9
FIRSTLT	0.0280	−0.4218	8.1406	0.0043	−0.0652	−34.1
MAJOR	0.1250	0.8561	72.9088	0.0001	0.1323	69.3
LTCOL	0.1091	−1.7226	39.1153	0.0001	−0.2662	−139.4
Observations (N=)	12167					
Leavers	2324					
Base Probability of Accepting	0.1910					
Model χ^2	1174.857					
Concordant Ratio	71.2					

Table 11.   1993 Air Force VSI/SSB Acceptance Model

		Logistic Regression Model				
Variable	Mean	β	Wald χ^2	Pr > χ^2	$\delta P/\delta X$	% δP
BLACK	0.0752	0.1142	1.9242	0.1654	0.0118	10.1
HISPANIC	0.0266	0.1389	1.1079	0.2925	0.0143	12.3
OTHMINOR	0.0092	−0.1273	0.3006	0.5835	−0.0131	−11.2
ASIAN/PI	0.0164	0.2567	2.4977	0.1140	0.0265	22.7
FEMALE	0.1232	−0.0639	0.8427	0.3586	−0.0066	−5.6
AGE	36.5157	0.1224	144.193	0.0001	0.0126	10.8
YOS	14.1488	−0.1943	258.353	0.0001	−0.0201	−17.2
MIG	43.5345	0.0022	3.4071	0.0649	0.0002	0.2
NUMDEPS	3.3164	−0.0943	32.6479	0.0001	−0.0097	−8.3
ACAD	0.1296	−0.6785	44.0464	0.0001	−0.0700	−59.9
POSTGRAD	0.7161	−1.1412	560.839	0.0001	−0.1178	−100.8
OPERATNL	0.3656	0.4775	81.2836	0.0001	0.0493	42.2
MAJOR	0.4710	−1.8633	439.601	0.0001	−0.1924	−164.5
LTCOL	0.1258	−4.0096	103.140	0.0001	−0.4139	−354.1
Observations (N=)		23036				
Leavers		2693				
Base Probability of Accepting		0.1169				
Model χ^2		4182.055				
Concordant Ratio		84.6				

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Table 12.   1993 Navy VSI/SSB Acceptance Model

		Logistic Regression Model				
Variable	Mean	β	Wald χ^2	Pr > χ^2	$\delta P/\delta X$	% δP
BLACK	0.0486	−0.1690	0.9296	0.3350	−0.0091	−15.9
HISPANIC	0.0214	−0.3314	1.7190	0.1898	−0.0179	−31.2
ASIAN/PI	0.0173	−0.6153	3.0899	0.0788	−0.0333	−58.0
FEMALE	0.1038	0.6273	22.1579	0.0001	0.0339	59.1
AGE	35.3317	0.0506	10.4838	0.0012	0.0027	4.8
YOS	13.6092	−0.2121	159.358	0.0001	−0.0115	−20.0
MIG	42.2672	0.0109	29.8150	0.0001	0.0006	1.0
NUMDEPS	3.0761	−0.0309	1.1221	0.2895	−0.0017	−2.9
ACAD	0.1593	−0.0581	0.3268	0.5675	−0.0031	−5.5
POSTGRAD	0.3006	−0.5622	28.3778	0.0001	−0.0304	−53.0
OPERATNL	0.5428	0.8069	70.6836	0.0001	0.0436	76.1
LTJG	0.0244	−1.8993	26.7127	0.0001	−0.1026	−179.0
LCDR	0.4551	−1.1603	76.6419	0.0001	−0.0627	−109.4
Observations (N=)		14879				
Leavers		853				
Base Probability of Accepting		0.0573				
Model χ^2		982.803				
Concordant Ratio		79.2				

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VI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

This thesis attempts to assess the effects of the recent military downsizing on minority officer retention and other representation issues. Available data suggest minorities have not been adversely affected by the drawdown, at least in the area of retention.

The cross-sectional analysis reveals that minority representation has generally increased across all services throughout the downsizing, period with the possible exception of the higher paygrades. Minority representation for officers of the grade O-6 and above did not change much throughout the 1987-1994 period, and remains at relatively low levels compared to the lower officer paygrades. There is some evidence that shifts in the occupational mix of officers during the downsizing may have aided the increase in minority representation, especially in the Army and Air Force.

Two somewhat disturbing phenomena were discovered in the longitudinal analysis--namely, the increased probability of early (zero to three years) attrition for black officers, and the increased tendency of black officers to exit at key career decision points. The high early attrition rates are most likely associated with failures in the initial training pipeline. The increased tendency for separation at key career decision point is evidenced by the higher separation probabilities of blacks around ten to fourteen years of commissioned service, depending upon branch, as well as increased probabilities of separation during early retirement eligibility.

Two factors are likely to be influencing minority decisions with respect to this behavior. The first is the fact that, although the military's equal opportunity climate

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is perceived to be better than in the private sector, there are still questions about the prospects of long-term military career for minorities. The low number of minority O-6s, flag, and general officers attest to this perception of a "glass ceiling" and certain career limitations at the top. A second factor that is likely influencing minority behavior is the competition from the private sector for highly qualified minorities with distinguished records of service in the military.

Drawdown policies and programs such as VSI/SSB appear to have had an equalizing effect on differences in separation behavior between racial and ethnic groups. It will be important now to see if these differences reemerge after drawdown policies end no longer in force. There is some evidence in the present study that this may already be happening.

B. RECOMMENDATIONS FOR FUTURE RESEARCH

Based on these findings, the following recommendations are offered. The multivariate models used in this analysis could be bolstered in many ways. Performance is undoubtably linked to the retention decision, just as it is to promotion. Consequently, the predictability of the models could be improved by the inclusion of one or more measures of performance. The VSI/SSB models could be improved by the inclusion of an ACOL variable that captures future promotion probability and expected civilian and military earnings.

A detailed study needs to be conducted of early officer attrition. It is apparent that minority officers with zero to three years of commissioned service leave the military at higher rates than their non-minority peers. This is opposite to what has been found in the enlisted force. Defense Manpower officials, policy analysts, and others should be

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asking: "Why is this happening, and what can be done about it?"

Next, since the higher mid-career separation rates of minorities compared to non-minorities appear to be associated with promotion to O-4, continuing research should focus on the link between retention and promotion at this career point. From a policy standpoint, commanding officers, detailers, and others with career-counseling responsibilities need to be aware that this is a critical decision point for minority officers and that stressing the improvements in the military's equal opportunity atmosphere may help reduce minority separations.

Finally, it will be important to look at minority retention and representation issues throughout the remainder of the drawdown and beyond to see if trends identified previous to the drawdown reemerge.   It is quite clear that minority representation issues will be of concern to the military for many years to come.

APPENDIX A. RESULTS OF CROSS-SECTIONAL ANALYSIS

This appendix contains selected results of cross-tabulations performed on the DMDC end of year cross-sectional files for fiscal 1987 through 1994, inclusive. Minority representation figures (for paygrades O-1 through O-10) are presented by service as well as by selected paygrades and occupations. The final tables indicate the shift in the occupational mix of officers throughout the drawdown for each service.

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	9,801	9,868	10,019	10,011	*10,018*	9,398	8,353	8,137	-1,664
Pct	10.5	10.7	10.9	11.2	11.3	*11.6*	11.2	11.3	+0.8
Navy	2,289	2,417	2,518	2,700	2,762	2,838	2,860	*2,889*	+600
Pct	3.3	3.5	3.6	3.9	4.1	4.3	4.5	*4.9*	+1.6
Marine	836	837	*880*	834	819	793	764	775	-61
Pct	4.5	4.5	*4.8*	4.6	4.6	4.6	4.6	*4.8*	+0.3
Air Force	5,565	5,665	5,676	5,563	5,484	5,144	4,738	4,567	-1118
Pct	5.3	5.4	5.5	5.6	*5.7*	*5.7*	5.6	5.6	+0.3
Total DoD	18,611	18,787	19,093	*19,108*	19,083	18,173	16,715	16,368	-2,243
Pct	6.5	6.6	6.7	6.9	7.0	7.1	7.0	*7.2*	+0.7

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table Al. Black Officer Representation, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	1,288	1,345	1,500	1,599	1,708	1,754	1,852	2,007	+719
Pct	1.4	1.5	1.6	1.8	1.9	2.2	2.5	*2.8*	+1.4
Navy	1,243	1,360	1,528	1,643	1,697	1,745	*1,786*	1,783	+540
Pct	1.8	2.0	2.2	2.4	2.5	2.6	2.8	*3.0*	+1.2
Marine	332	360	404	429	451	476	474	*497*	+165
Pct	1.8	1.9	2.2	2.4	2.5	2.8	2.9	*3.1*	+1.3
Air Force	*2,165*	2,138	2,105	2,034	1,954	1,832	1,656	1,575	-590
Pct	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	1.9	-0.1
Total DoD	5,028	5,203	5,537	5,725	5,810	5,807	5,768	*5,862*	+834
Pct	1.7	1.8	2.0	2.0	2.1	2.3	2.4	*2.6*	+0.9

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A2. Hispanic Officer Representation, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	1,125	1,172	1,300	1,442	1,551	1,523	1,573	*1,680*	+555
Pct	1.2	1.3	1.4	1.6	1.8	1.9	2.1	*2.3*	+1.1
Navy	1,110	1,200	1,312	1,407	1,479	1,538	1,588	*1,600*	+490
Pct	1.6	1.7	1.9	2.0	2.2	2.3	2.5	*2.7*	+1.1
Marine	174	189	212	219	220	220	222	*228*	+54
Pct	0.9	1.0	1.2	1.2	1.2	1.3	1.3	*1.4*	+0.5
Air Force	1,497	1,487	1,517	1,505	*1,518*	1,454	1,376	1,336	-161
Pct	1.4	1.4	1.5	1.5	1.6	1.6	1.6	*1.7*	+0.3
Total DoD	3,906	4,048	4,341	4,573	4,768	4,735	4,759	*4,844*	+938
Pct	1.4	1.4	1.5	1.7	1.8	1.9	2.0	*2.1*	+0.7

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A3. Asian/Pacific Islander Officer Representation, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	1,432	1,515	1,508	1,497	*1,551*	1,529	1,424	1,384	-48
Pct	1.5	1.6	1.6	1.7	1.8	*1.9*	*1.9*	*1.9*	+0.4
Navy	594	*598*	492	513	495	503	491	398	-196
Pct	*0.9*	*0.9*	0.7	0.7	0.7	0.8	0.8	0.7	-0.2
Marines	112	129	158	167	166	168	169	*170*	+58
Pct	1.1	1.2	1.3	1.4	1.5	1.6	1.8	*2.0*	+0.9
Air Force	1,138	1,224	1,366	1,436	1,459	1,435	1,474	*1,646*	+508
Pct	1.1	1.2	1.3	1.4	1.5	1.6	1.8	*2.0*	+0.9
Total DoD	3,321	3,446	3,524	3,613	3,671	3,635	3,558	*3,598*	+277
Pct	1.2	1.2	1.2	1.3	1.4	1.4	1.5	*1.6*	+0.4

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in **bold *italics***.

Table A4. Other Minority Officer Representation, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	1,326	1,383	1,502	1,631	1,848	*1,861*	1,863	1,811	+485
Pct	7.7	8.2	8.8	9.5	10.3	11.4	12.0	*12.5*	+4.8
Navy	418	444	452	449	*455*	449	442	417	-1
Pct	3.1	3.3	3.3	3.3	3.3	3.4	3.5	3.7	+0.6
Marines	129	139	*141*	139	138	133	118	121	-8
Pct	4.0	4.3	*4.4*	*4.4*	*4.4*	*4.4*	4.0	4.0	0
Air Force	802	938	1,098	1,148	1,175	*1,242*	1,236	1,195	+393
Pct	4.0	4.8	5.6	6.0	6.4	7.1	*7.4*	*7.4*	+3.4
Total DoD	2,675	2,904	3,193	3,367	3,616	*3,685*	3,659	3,544	+869
Pct	5.0	5.5	5.9	6.3	6.8	7.3	7.6	*7.9*	+2.9

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A5. Black Officer Representation, Within Paygrade O-4, by Service,
1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	235	219	237	249	296	329	396	**422**	+187
Pct	1.4	1.3	1.4	1.5	1.7	2.0	2.5	**2.9**	+1.5
Navy	174	181	184	202	208	208	213	**248**	+74
Pct	1.3	1.3	1.3	1.5	1.5	1.6	1.7	**2.2**	+0.9
Marines	35	33	36	40	49	50	50	**62**	+28
Pct	1.1	1.0	1.1	1.3	1.6	1.6	1.7	**2.1**	+1.0
Air Force	329	373	433	445	468	**472**	440	426	+97
Pct	1.7	1.9	2.2	2.3	2.5	**2.7**	2.6	**2.7**	+1.0
Total DoD	773	806	890	936	1,021	1,059	1,099	**1,158**	+385
Pct	1.4	1.5	1.7	1.8	1.9	2.1	2.3	**2.6**	+1.2

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A6. Hispanic Officer Representation, Within Paygrade O-4, by Service, 1987-1994

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	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	195	201	219	243	251	229	256	253	+58
Pct	1.1	1.2	1.3	1.4	1.4	1.4	1.6	1.8	+0.7
Navy	116	128	160	180	204	223	230	236	+120
Pct	0.9	0.9	1.2	1.3	1.5	1.7	1.8	2.1	+1.2
Marines	20	15	19	20	25	24	27	34	+14
Pct	0.6	0.5	0.6	0.6	0.8	0.8	0.9	1.1	+0.5
Air Force	202	205	228	255	247	275	292	304	+102
Pct	1.0	1.1	1.2	1.3	1.3	1.6	1.7	1.9	+0.9
Total DoD	533	549	626	698	727	751	805	827	+294
Pct	1.0	1.0	1.2	1.3	1.4	1.5	1.7	1.8	+0.8

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A7. Asian/Pacific Islander Officer Representation, Within Paygrade O-4, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	199	215	218	237	293	*308*	296	278	+79
Pct	1.2	1.3	1.3	1.4	1.6	*1.9*	*1.9*	*1.9*	+0.7
Navy	103	*113*	108	107	105	104	94	74	-29
Pct	*0.8*	*0.8*	*0.8*	*0.8*	*0.8*	*0.8*	0.7	0.7	-0.1
Marines	*20*	19	15	16	17	12	13	13	-7
Pct	*0.6*	*0.6*	0.5	0.5	0.5	0.4	0.4	0.4	-0.2
Air Force	194	188	190	*198*	192	187	167	156	-38
Pct	1.0	1.0	1.0	1.0	1.0	*1.1*	1.0	1.0	0
Total DoD	516	535	531	558	607	*611*	570	521	+5
Pct	1.0	1.0	1.0	1.1	1.1	*1.2*	*1.2*	*1.2*	+0.2

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A8. Other Minority Officer Representation, Within Paygrade O-4,
by Service, 1987-1994

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	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	*225*	213	205	206	218	202	190	185	-40
Pct	4.8	4.8	4.8	4.6	4.7	4.6	4.8	*4.9*	+0.1
Navy	29	28	30	32	42	43	48	*58*	+29
Pct	0.8	0.7	0.8	0.8	1.2	1.2	1.3	*1.7*	+0.9
Marines	7	10	9	9	8	14	*14*	*18*	+11
Pct	1.1	1.5	1.4	1.4	1.3	2.2	2.2	*2.9*	+1.8
Air Force	*129*	123	112	104	94	85	88	90	-39
Pct	*2.3*	2.2	2.1	2.1	1.9	1.9	2.0	2.1	-0.2
Total DoD	*390*	374	356	351	362	344	340	351	-39
Pct	2.7	2.6	2.5	2.5	2.6	2.6	2.7	*2.9*	+0.2

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A9. Black Officer Representation, Within Paygrade O-6, by
Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	52	48	43	37	42	50	54	*59*	+7
Pct	1.1	1.1	1.0	0.8	0.9	1.1	1.4	*1.6*	+0.5
Navy	20	21	26	28	23	24	27	*31*	+11
Pct	0.5	0.6	0.7	0.7	0.6	0.7	0.7	*0.9*	+0.4
Marines	5	6	4	4	5	5	6	7	+2
Pct	0.8	0.9	0.6	0.6	0.8	0.8	1.0	*1.1*	+0.3
Air Force	61	*63*	62	55	56	56	51	49	-12
Pct	1.1	1.1	*1.2*	1.1	*1.2*	*1.2*	*1.2*	1.1	0
Total DoD	138	138	135	124	126	135	138	*146*	+8
Pct	0.9	1.0	1.0	0.9	0.9	1.0	1.1	*1.2*	+0.3

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A10.   Hispanic Officer Representation, Within Paygrade O-6,
by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	65	65	66	70	*77*	75	64	62	-3
Pct	1.4	1.5	1.5	1.6	*1.7*	*1.7*	1.6	1.6	+0.2
Navy	27	32	37	36	37	*40*	*40*	38	+11
Pct	0.7	0.8	1.0	0.9	1.0	*1.1*	*1.1*	*1.1*	+0.4
Marines	0	0	0	0	0	*2*	*2*	*2*	+2
Pct	0	0	0	0	0	*0.3*	*0.3*	*0.3*	+0.3
Air Force	66	*74*	71	70	67	61	62	65	-1
Pct	1.2	1.3	1.3	1.4	1.4	1.3	1.4	*1.5*	+0.3
Total DoD	158	171	174	176	*181*	178	168	167	+9
Pct	1.1	1.2	1.2	1.3	1.3	1.3	1.3	*1.4*	+0.3

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A11. Asian/Pacific Islander Officer Representation, Within
Paygrade O-6, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	27	26	33	40	40	*47*	45	39	+12
Pct	0.6	0.6	0.8	0.9	0.9	*1.1*	1.1	1.0	+0.5
Navy	11	*17*	*17*	14	13	12	9	12	+1
Pct	0.3	*0.4*	*0.4*	*0.4*	*0.4*	0.3	0.3	0.3	0
Marines	0	0	0	0	0	0	*1*	*1*	+1
Pct	0	0	0	0	0	0	*0.2*	*0.2*	+0.2
Air Force	35	36	38	37	37	38	37	*41*	+6
Pct	0.6	0.7	0.7	0.7	0.8	0.8	0.9	*1.0*	+0.4
Total DoD	73	79	88	91	90	97	92	93	+20
Pct	0.5	0.5	0.6	0.7	0.7	0.7	0.7	*0.8*	+0.3

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A12. Other Minority Officer Representation, Within Paygrade O-6,
by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	*29*	*29*	26	27	25	25	25	22	-7
Pct	*7.1*	*7.1*	6.4	6.6	6.4	6.8	6.9	6.6	-0.5
Navy	*5*	4	3	3	3	3	3	4	-1
Pct	*1.9*	1.6	1.2	1.2	1.2	.2	1.3	1.8	-0.1
Marines	*1*	0	0	0	1	1	1	0	-1
Pct	1.4	0	0	0	*1.5*	1.5	1.5	0	-1.4
Air Force	4	4	4	3	6	5	5	*6*	+2
Pct	1.2	1.2	1.2	0.9	1.9	1.6	1.7	*2.0*	+1.8
Total DoD	*39*	37	33	33	35	34	34	32	-7
Pct	3.6	3.5	3.1	3.1	3.4	3.4	3.5	3.1	-0.5

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A13. Black Officer Representation, Within Paygrades O-7 through
O-10, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	1	1	1	2	2	3	3	2	+1
Pct	0.3	0.3	0.3	0.5	0.5	0.8	0.8	0.6	+0.3
Navy	3	3	4	3	4	3	3	3	0
Pct	1.2	1.2	1.6	1.2	1.6	1.2	1.3	1.3	+0.1
Marines	0	0	0	0	0	0	0	0	0
Pct	0	0	0	0	0	0	0	0	0
Air Force	1	2	1	3	3	3	4	5	+4
Pct	0.3	0.6	0.3	0.9	0.9	1.0	1.4	1.7	+1.4
Total DoD	5	6	6	8	9	9	10	10	+5
Pct	0.5	0.6	0.6	0.8	0.9	0.9	1.0	1.1	0.6

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A14. Hispanic Officer Representation, Within Paygrades O-7 through O-10, by Service, 1987-1994

87

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	3	3	3	3	6	6	4	2	-1
Pct	0.7	0.7	0.7	0.7	*1.6*	*1.6*	1.1	0.6	-0.1
Navy	*2*	2	*2*	*2*	*2*	*2*	2	1	-1
Pct	*0.8*	*0.8*	*0.8*	*0.8*	*0.8*	*0.8*	*0.8*	0.4	-0.4
Marines	0	0	0	0	0	0	0	0	0
Pct	0	0	0	0	0	0	0	0	0
Air Force	1	1	1	1	1	1	1	1	0
Pct	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0
Total DoD	6	6	6	6	*9*	*9*	7	4	-2
Pct	0.6	0.6	0.6	0.6	*0.9*	*0.9*	0.7	0.4	-0.2

Figures depict representation on the last day of the Fiscal Year (30 Sept). Peak Year(s) for each row are shown in *bold italics*.

Table 15. Asian/Pacific Islander Officer Representation, Within Paygrades O-7 through O-10, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	0	1	1	1	0	0	1	*2*	+2
Pct	0	0.3	0.3	0.3	0	0	0.3	*0.6*	+0.6
Navy	1	1	1	1	0	1	1	1	0
Pct	0.4	0.4	0.4	0.4	0	0.4	0.4	0.4	0
Marines	0	0	0	0	0	0	0	0	0
Pct	0	0	0	0	0	0	0	0	0
Air Force	0	0	0	0	0	1	3	*5*	+5
Pct	0	0	0	0	0	0.3	1.0	*1.7*	+1.7
Total DoD	1	2	2	2	0	2	5	*8*	+7
Pct	0.1	0.2	0.2	0.2	0	0.2	0.5	*0.9*	+0.8

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A16. Other Minority Officer Representation, Within Paygrades O-7 through O-10, by Service, 1987-1994

89

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Army	29	*29*	26	27	25	25	25	22	-7
Pct	7.1	*7.1*	6.4	6.6	6.4	6.8	6.9	6.6	-0.5
Navy	58	*4*	3	3	3	3	3	*4*	0
Pct	1.8	1.6	1.2	1.2	1.2	1.2	1.3	*1.8*	+0.2
Marines[*]	8	10	8	9	9	13	14	*18*	+8
Pct	1.1	1.4	1.2	1.3	1.3	1.9	2.0	2.6	+1.2
Air Force	38	4	4	3	6	5	5	*10*	+6
Pct	2.0	1.2	1.2	0.9	*1.9*	1.6	1.7	1.2	0
Total DoD	133	*47*	41	42	43	46	*47*	54	+7
Pct	2.1	2.8	2.4	2.5	2.6	2.8	*3.0*	2.6	-0.2

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.
[*]The Marine Corps includes Colonels (O-6's) in this group.

Table A17.   Black Representation Among General Officers and Executives, N.E.C., by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 87-94
Army	3,633	*3,600*	3,492	3,325	3,264	3,006	2,534	2,461	-1,139
Pct	8.8	8.7	8.7	8.9	8.9	*9.1*	8.6	8.7	0
Navy	387	664	704	738	759	804	*825*	768	+104
Pct	2.8	2.4	2.5	2.6	2.7	3.0	3.2	3.3	+0.9
Marines	298	*307*	304	294	277	259	245	243	-64
Pct	3.0	3.1	3.1	*3.1*	3.0	2.9	2.8	2.9	-0.2
Air Force	1,215	1,246	1,255	1,232	*1,257*	1,168	1,024	953	-293
Pct	3.0	3.0	3.2	3.2	3.4	*3.5*	3.3	3.3	+0.3
Total DoD	5,533	*5,817*	5,755	5,589	5,557	5,237	4,628	4,425	-1,392
Pct	5.2	4.8	4.9	4.9	5.0	*5.1*	4.9	5.0	+0.2

Figures depict representation on the last day of the Fiscal Year (30 Sept). Peak Year(s) for each row are shown in *bold italics*.

Table A18. Black Representation Among Tactical Operations Officers, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Army	327	367	429	453	475	454	414	424	+57
Pct	6.2	6.8	7.6	8.3	8.7	8.8	8.3	8.5	+1.7
Navy	55	51	52	59	70	72	82	95	+44
Pct	2.6	2.4	2.5	2.8	3.3	3.5	4.0	4.6	+2.2
Marines	14	16	15	12	10	11	11	12	-4
Pct	2.5	2.7	2.5	2.1	1.8	2.1	2.0	2.2	-0.5
Air Force	202	194	193	187	183	173	153	155	-39
Pct	5.0	4.6	4.7	4.7	4.6	4.6	4.4	4.4	-0.2
Total DoD	598	628	689	711	738	710	660	686	+58
Pct	5.0	5.1	5.5	5.9	6.1	6.1	5.9	6.2	+1.1

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A19. Black Representation Among Intelligence officers, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Army	1,488	1,468	*1,506*	1,434	1,406	1,292	1,146	1,146	-385
Pct	14.8	*16.7*	16.0	16.1	16.5	17.2	15.8	15.3	-0.6
Navy	453	211	225	248	246	266	281	*322*	+111
Pct	3.2	3.4	3.6	4.0	4.0	4.4	4.7	*5.5*	+2.1
Marines	89	84	*87*	77	76	67	57	56	-28
Pct	6.5	6.1	*6.4*	6.0	6.1	5.9	5.4	5.5	-0.6
Air Force	825	*1,194*	1,188	1,115	1,096	1,040	915	913	-281
Pct	5.3	6.7	6.7	6.8	6.8	*7.1*	6.9	6.7	0
Total DoD	2,882	2,957	*3,006*	2,874	2,824	2,665	2,399	2,374	-583
Pct	6.9	8.6	8.7	8.7	8.9	*9.1*	8.7	8.7	+0.1

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A20. Black Representation Among Engineering and Maintenance Officers, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Army	244	253	253	310	*311*	231	217	223	-30
Pct	7.1	7.5	7.4	7.8	7.6	7.6	7.5	***7.9***	+0.4
Navy	207	136	142	143	155	154	157	*158*	+22
Pct	3.8	5.1	5.4	5.6	6.2	6.2	6.4	***6.6***	+1.5
Marines	20	21	24	23	23	*28*	22	15	-6
Pct	3.7	3.9	4.4	4.4	4.8	*5.9*	4.8	3.4	-0.5
Air Force	310	262	267	264	263	267	281	*290*	+28
Pct	5.2	4.0	4.1	4.1	4.1	4.3	4.7	***5.4***	+1.4
Total DoD	781	672	686	740	752	680	677	686	+14
Pct	5.1	5.1	5.2	5.5	5.6	5.6	*5.8*	6.2	+1.1

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A21.   Black Representation Among Scientists and Professionals,
by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Army	1,469	1,509	1,583	1,655	1,683	*1,787*	1,711	1,714	+205
Pct	8.5	8.6	9.0	9.4	9.5	9.9	10.1	*10.5*	+1.9
Navy	282	419	450	499	514	544	560	*584*	+165
Pct	3.2	3.7	4.0	4.3	4.3	4.5	4.7	*4.9*	+1.2
Marines	0	0	0	0	0	0	0	0	0
Pct	0	0	0	0	0	0	0	0	0
Air Force	766	802	844	*900*	886	839	847	836	+34
Pct	5.3	5.6	5.8	*6.1*	6.0	5.8	6.0	5.9	+0.3
Total DoD	2,517	2,730	2,877	3,054	3,083	3,120	3,118	*3,134*	+404
Pct	6.2	6.3	6.6	6.9	7.0	7.1	7.2	*7.4*	+1.1

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A22. Black Representation Among Health Care Officers, by Service, 1987-1994

96

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Army	1,090	*1,067*	1,040	1,039	1,040	970	849	817	-250
Pct	16.2	16.7	16.9	17.1	17.5	*18.5*	18.1	18.4	+1.7
Navy	422	310	309	318	331	*347*	342	319	+9
Pct	4.4	7.5	7.8	8.2	8.9	9.6	9.9	*10.4*	+2.9
Marines	114	109	116	*117*	*117*	111	112	104	-5
Pct	8.4	8.4	8.9	9.2	9.6	9.8	10.2	*10.2*	+1.8
Air Force	1,598	*1,113*	1,068	1,014	980	902	782	743	-370
Pct	10.5	11.7	11.8	*11.9*	*11.9*	11.7	11.4	11.3	-0.4
Total DoD	3,224	*2,599*	2,533	2,488	2,468	2,330	2,085	1,983	-616
Pct	9.8	12.2	12.4	12.6	12.9	13.2	13.0	*13.1*	+0.9

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in **bold italics**.

Table A23. Black Representation Among Administrators, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Army	1,512	1,568	1,658	1,631	*1,682*	1,633	1,401	1,339	-229
Pct	18.3	18.7	18.9	19.3	*19.4*	19.3	18.3	18.2	-0.5
Navy	174	198	216	238	260	285	296	*308*	+110
Pct	4.9	4.3	4.6	5.2	5.7	6.5	7.2	*8.2*	+3.9
Marines	187	190	201	209	*221*	203	188	182	-8
Pct	9.0	9.0	9.7	9.4	*10.2*	10.0	9.9	10.1	+1.1
Air Force	643	*775*	760	732	718	684	644	617	-158
Pct	10.7	*9.5*	9.3	9.4	*9.5*	9.3	8.9	9.0	-0.5
Total DoD	2,516	2,731	2,835	2,810	*2,881*	2,805	2,529	2,446	-285
Pct	12.7	11.7	12.0	12.2	*12.6*	12.6	12.1	12.4	+0.7

Figures depict representation on the last day of the Fiscal Year (30 Sept).
Peak Year(s) for each row are shown in *bold italics*.

Table A24. Black Representation Among Supply, Procurement, and Allied
Officers, by Service, 1987-1994

97

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Army	2	0	0	0	0	1	0	0	0
Pct	1.3	0	0	0	0	33.3	0	0	0
Navy	0	423	413	449	419	359	311	328	-95
Pct	0	4.2	4.3	4.8	4.8	4.4	4.3	5.1	+0.9
Marines	105	100	125	93	86	96	115	144	+44
Pct	5.1	5.1	5.7	4.4	4.1	4.4	5.9	7.2	+2.1
Air Force	61	75	97	116	93	59	78	38	-37
Pct	2.2	2.5	2.9	3.7	3.8	3.3	4.9	3.1	+0.6
Total DoD	168	598	635	658	598	515	504	510	-88
Pct	3.4	4.0	5.0	4.5	4.5	4.2	4.7	5.3	+1.3

Figures depict representation on the last day of the Fiscal Year (30 Sept). Peak Year(s) for each row are shown in *bold italics*.

Table A25. Black Representation Among Non-Occupational Officers, by Service, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Occup 1	2.2	0.6	0.6	0.6	0.6	0.6	0.7	0.9	+.03
Occup 2	36.8	42.3	41.6	41.1	40.8	40.4	39.9	38.8	-3.5
Occup 3	4.1	4.3	4.4	4.4	4.4	4.5	4.6	4.9	+0.6
Occup 4	14.5	12.0	12.2	11.9	11.8	11.5	11.5	12.0	0
Occup 5	5.3	4.6	4.7	4.9	5.0	4.8	4.9	4.8	+0.2
Occup 6	14.1	15.1	15.3	15.9	16.3	17.3	18.1	18.5	+3.4
Occup 7	11.4	7.5	8.4	7.1	7.1	6.9	6.7	6.6	-0.9
Occup 8	6.9	8.2	8.4	8.3	8.5	8.7	8.7	8.7	+0.5
Occup 9	1.7	5.3	5.4	5.3	4.9	4.8	4.5	4.2	-0.9
Unknown	2.9	0.1	0.2	0.6	0.6	0.4	0.4	0.5	+0.4
Total	100	100	100	100	100	100	100	100	n/a
N=	288300	285431	283531	277224	271050	255240	239176	228495	-59805

Figures depict representation on the last day of the Fiscal Year (30 Sept).

Table A26. Percentage Distribution of Officers by DoD Occupational Category, 1987-1994

99

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Occup 1	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	+0.1
Occup 2	44.5	45.2	43.5	41.6	41.1	40.8	39.2	39.0	-6.2
Occup 3	5.6	5.9	6.1	6.1	6.2	6.4	6.7	6.9	+1.0
Occup 4	10.8	9.6	10.3	9.9	9.6	9.2	9.7	9.8	+0.2
Occup 5	3.7	3.7	3.7	4.4	4.6	3.7	3.8	3.9	+0.2
Occup 6	18.5	19.0	19.2	19.7	19.9	21.7	22.6	22.6	+3.2
Occup 7	7.2	6.9	6.7	6.8	6.7	6.5	6.3	6.1	-0.8
Occup 8	8.9	9.1	9.6	9.4	9.8	10.4	10.2	10.2	+1.1
Occup 9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Occup 10	0.1	0.3	0.5	1.7	1.7	0.9	1.0	1.0	+0.7
Total	100	100	100	100	100	100	100	100	0
N=	93160	92170	91891	89647	88695	81312	74945	72225	-20935

Figures depict representation on the last day of the Fiscal Year (30 Sept).

Table A27. Percentage Distribution of Army Officers by DoD Occupational Category,
1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Occup 1	4.8	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0
Occup 2	19.7	40.4	41.2	41.3	41.1	40.9	41.0	39.8	-0.6
Occup 3	3.1	3.0	3.0	3.1	3.1	3.2	3.3	3.5	+0.5
Occup 4	20.6	9.0	8.9	9.0	9.0	9.1	9.3	9.8	+0.8
Occup 5	7.8	3.8	3.8	3.7	3.7	3.8	3.9	4.0	+0.2
Occup 6	12.9	16.1	16.2	16.8	17.5	18.2	18.9	20.0	+3.9
Occup 7	13.9	5.9	5.7	5.6	5.5	5.5	5.4	5.2	-0.7
Occup 8	5.1	6.7	6.8	6.6	6.8	6.6	6.4	6.4	-0.3
Occup 9	0.0	14.6	14.0	13.5	13.0	12.4	11.3	10.9	-3.7
Occup 10	12.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
Total	100	100	100	100	100	100	100	100	0
N=	69071	69576	69475	69426	67980	66280	63608	59265	-9806

Figures depict representation on the last day of the Fiscal Year (30 Sept).

Table A28. Percentage Distribution of Navy Officers by DoD Occupational Category, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Occup 1	1.8	0.3	0.3	0.3	0.3	0.3	0.4	1.0	+0.7
Occup 2	38.1	38.9	38.3	38.5	38.2	37.4	36.9	35.2	-3.7
Occup 3	3.7	4.0	4.0	4.0	4.1	4.2	4.2	4.3	+0.3
Occup 4	15.1	17.1	17.1	16.5	16.6	16.3	15.7	16.7	-0.4
Occup 5	5.6	6.3	6.4	6.5	6.6	6.9	7.1	6.6	+0.3
Occup 6	13.4	13.7	14.1	14.8	15.3	16.1	16.9	17.5	+3.8
Occup 7	14.3	9.0	8.7	8.5	8.5	8.5	8.2	8.2	-0.8
Occup 8	5.6	7.8	7.9	7.8	7.8	8.1	8.6	8.5	+0.7
Occup 9	2.6	2.9	3.2	3.1	2.5	2.0	1.9	1.5	-1.4
Occup 10	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	+0.5
Total	100	100	100	100	100	100	100	100	0
N=	107340	105127	103699	100046	96600	90378	84076	81002	-26338

Figures depict representation on the last day of the Fiscal Year (30 Sept).

Table A29. Percentage Distribution of Air Force Officers by DoD Occupational
Category, 1987-1994

	1987	1988	1989	1990	1991	1992	1993	1994	Δ 88-94
Occup 1	3.8	3.8	3.8	3.9	3.8	4.0	4.2	4.3	+0.5
Occup 2	53.5	53.7	52.4	52.0	52.4	52.4	53.5	53.0	-0.7
Occup 3	3.0	3.2	3.3	3.2	3.1	3.1	3.3	3.5	+0.3
Occup 4	7.4	7.4	7.4	7.2	7.0	6.5	6.4	6.4	-1.0
Occup 5	2.9	2.9	3.0	2.9	2.7	2.8	2.8	2.8	-0.1
Occup 6	0	0	0	0	0	0	0	0	0
Occup 7	7.3	7.0	7.0	7.0	6.9	6.6	6.6	6.4	-0.6
Occup 8	11.1	11.3	11.3	12.3	12.2	11.8	11.5	11.3	0
Occup 9	11.0	10.6	11.9	11.6	12.0	12.7	11.8	12.5	+1.9
Occup 10	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.1	+0.1
Total	100	100	100	100	100	100	100	100	0
N=	18729	18558	18466	18105	17775	17270	16547	16003	-2726

Figures depict representation on the last day of the Fiscal Year (30 Sept).

Table A30.   Percentage Distribution of Marine Corps Officers by DoD Occupational Category, 1987-1994

APPENDIX B.   SEPARATION PROBABILILITY DENSITY FUNCTIONS

This appendix contains graphs of the separation probability density functions for each cohort--1977, 1980, 1983, and 1987--by service. The graphs represent the probability of separation of a randomly selected individual at any given month of commissioned service. Additionally, these graphs indicate the breakpoints for each phase of separation behavior that was modeled. Phases that occurred during the drawdown years are annotated.

Figure 1. 1977 Army Officer Cohort - Separation Probability Density Function
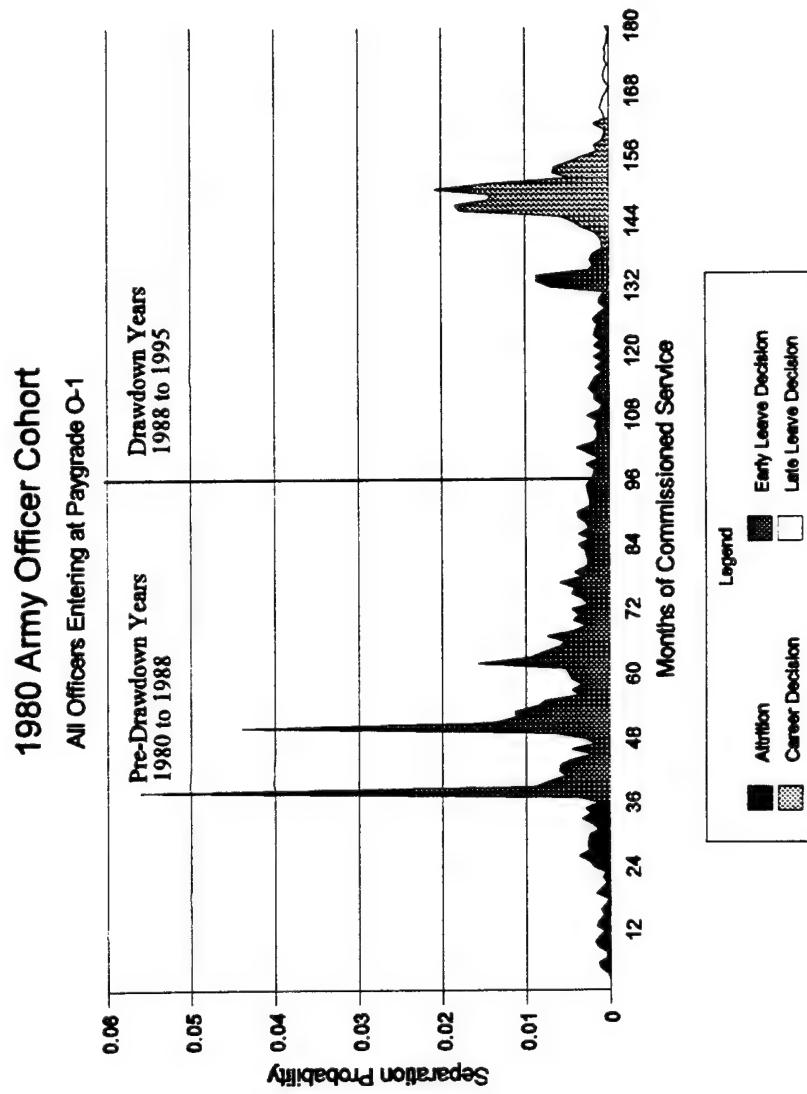
Figure 2. 1980 Army Officer Cohort – Separation Probability Density Function
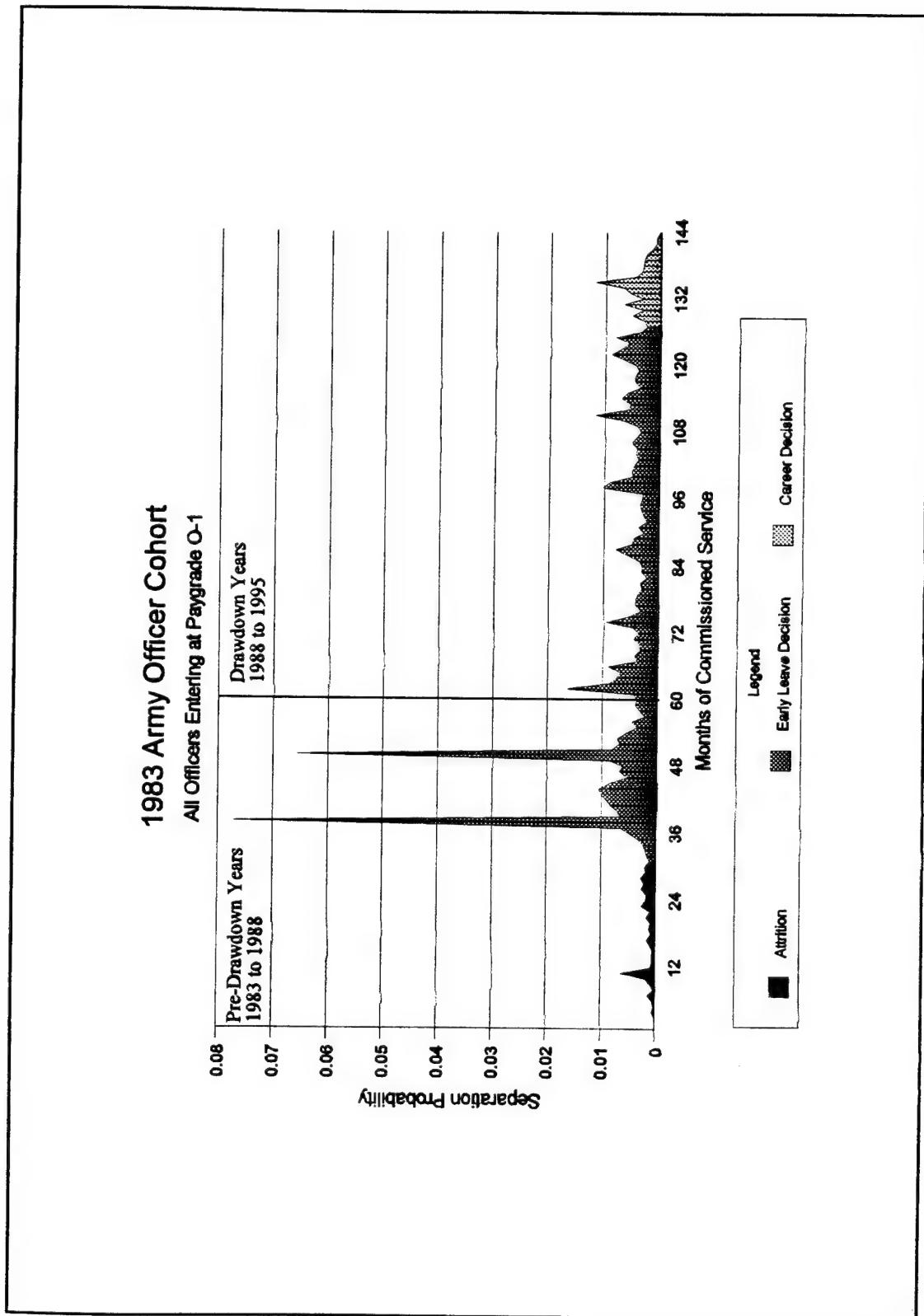
Figure 3. 1983 Army Officer Cohort – Separation Probability Density Function
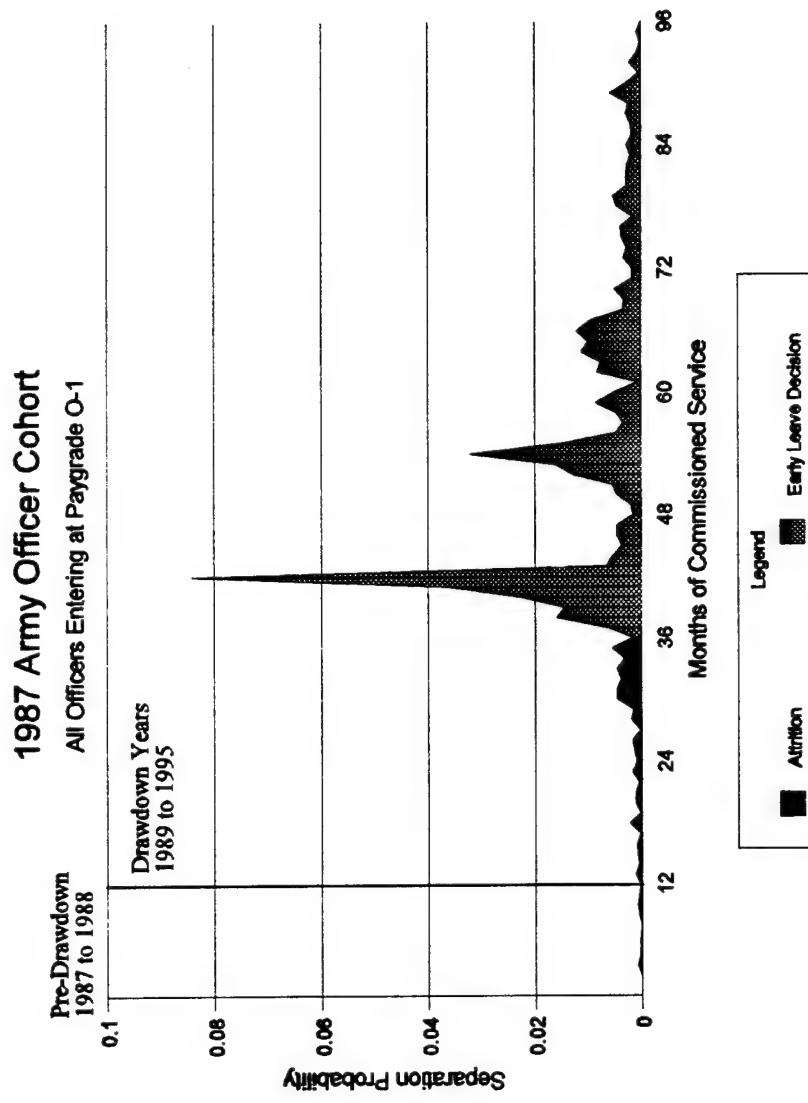
Figure 4. 1987 Army Officer Cohort - Separation Probability Density Function
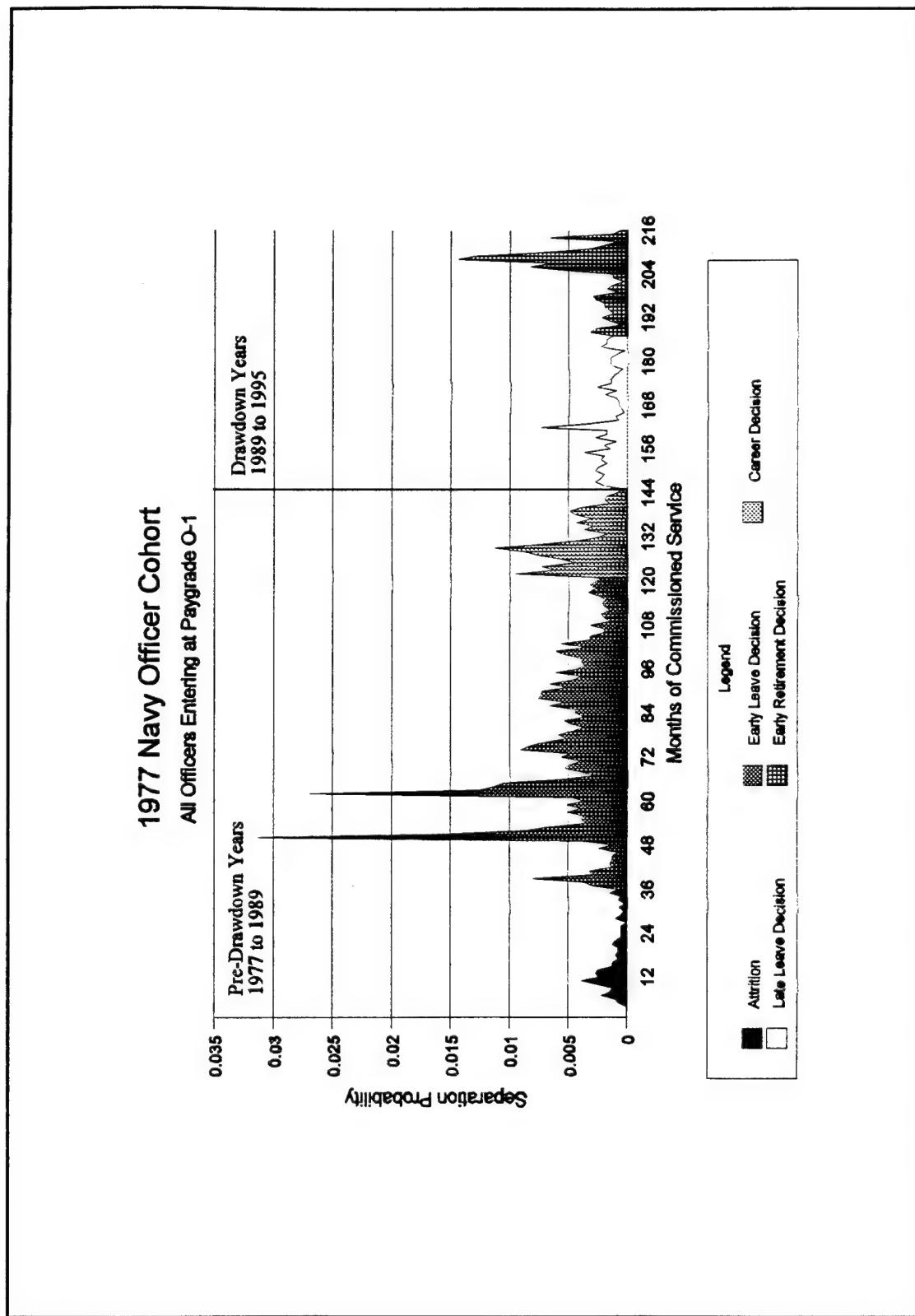
Figure 5. 1977 Navy Officer Cohort - Separation Probability Density Function

Figure 6. 1980 Navy Officer Cohort - Separation Probability Density Function
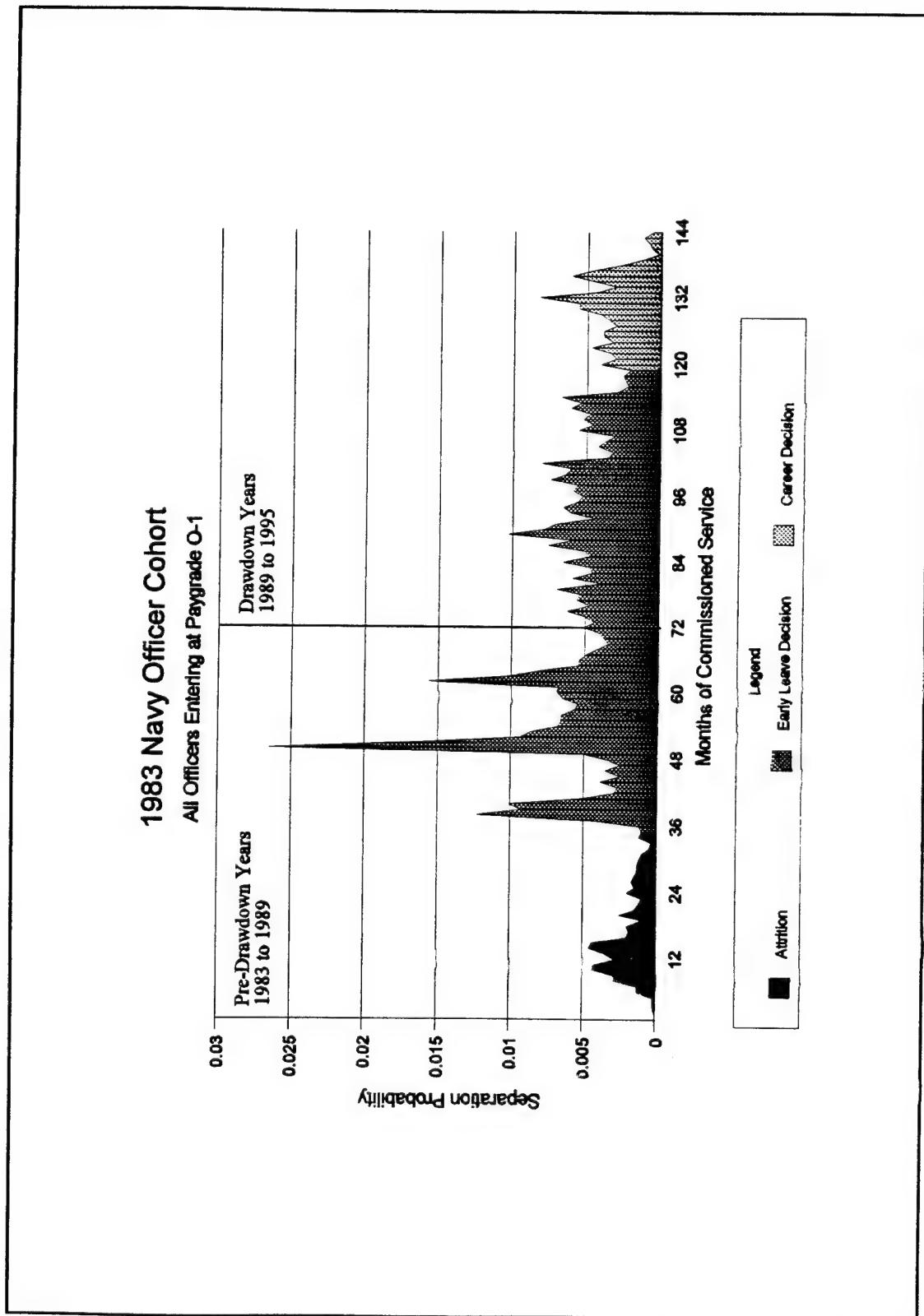
Figure 7. 1983 Navy Officer Cohort – Separation Probability Density Function
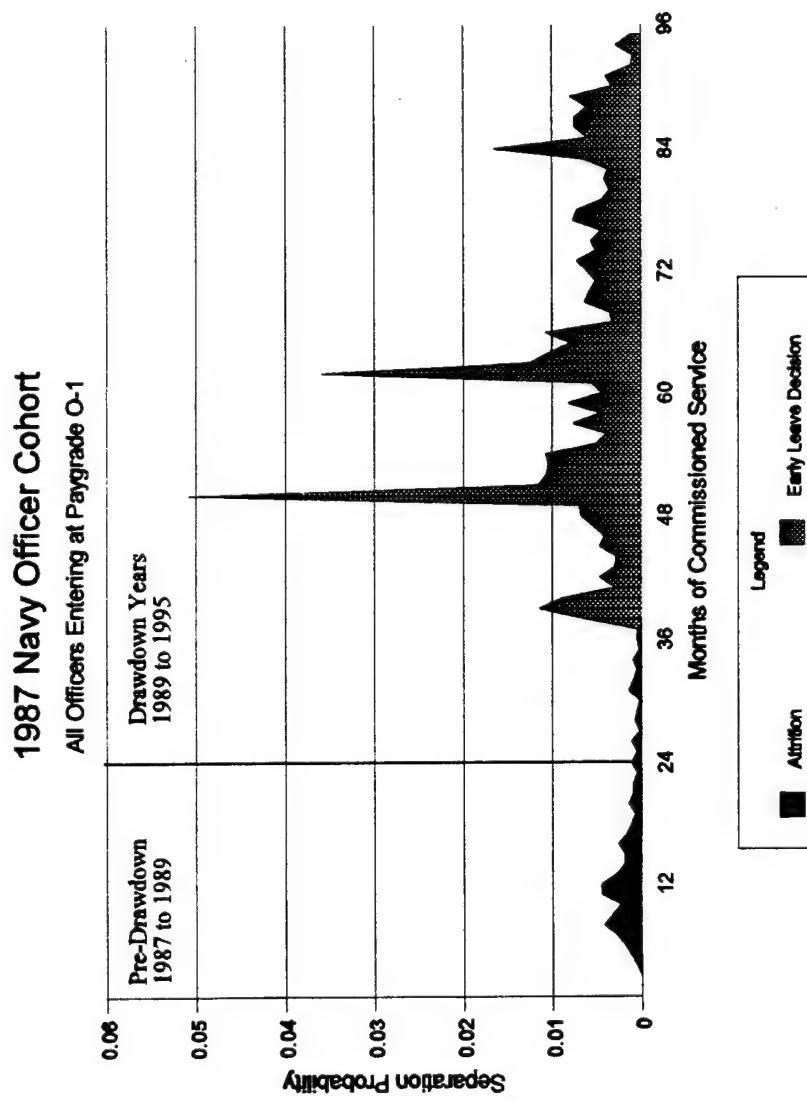
Figure 8. 1987 Navy Officer Cohort - Separation Probability Density Function
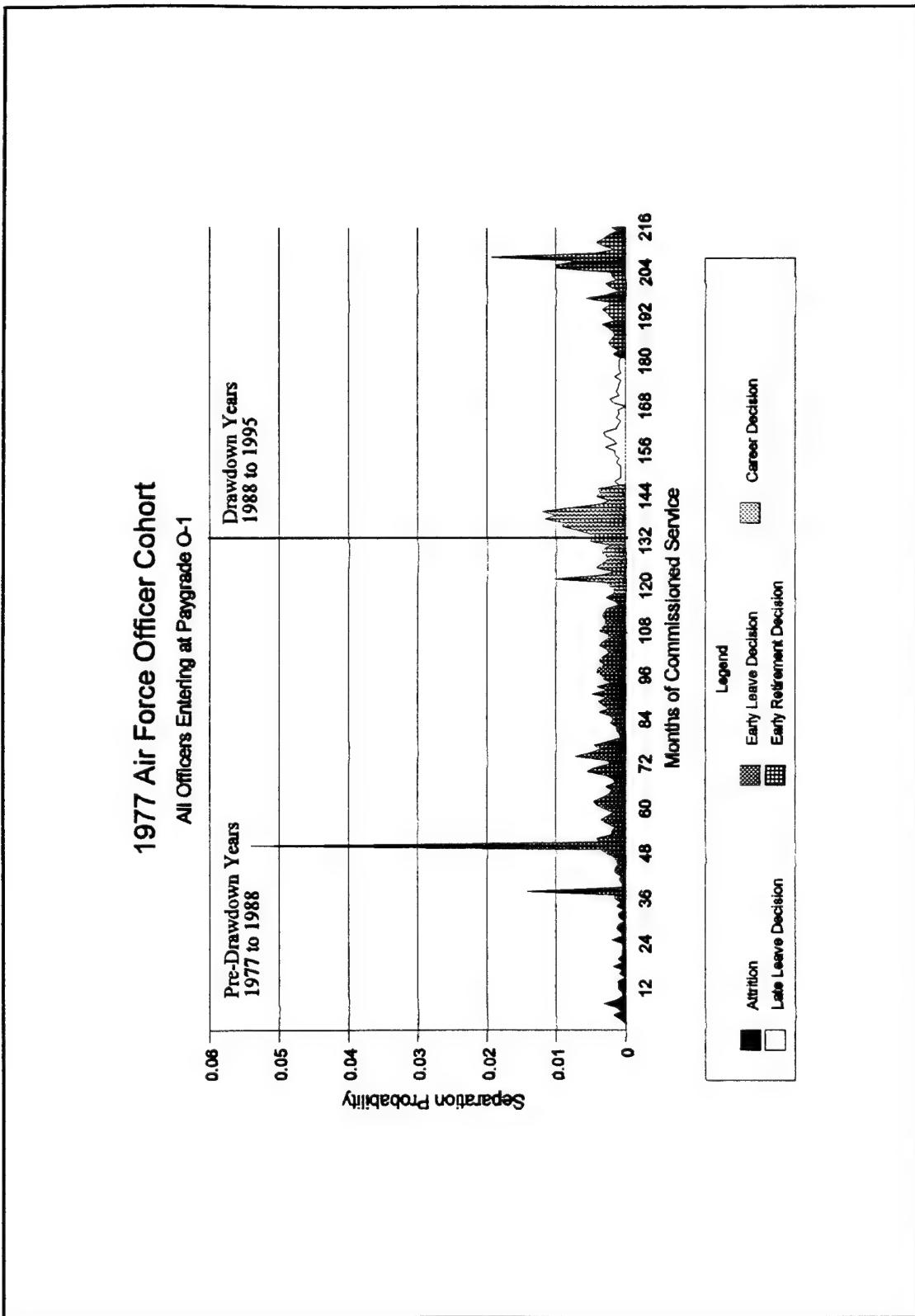
Figure 9. 1977 Air Force Officer Cohort - Separation Probability Density Function
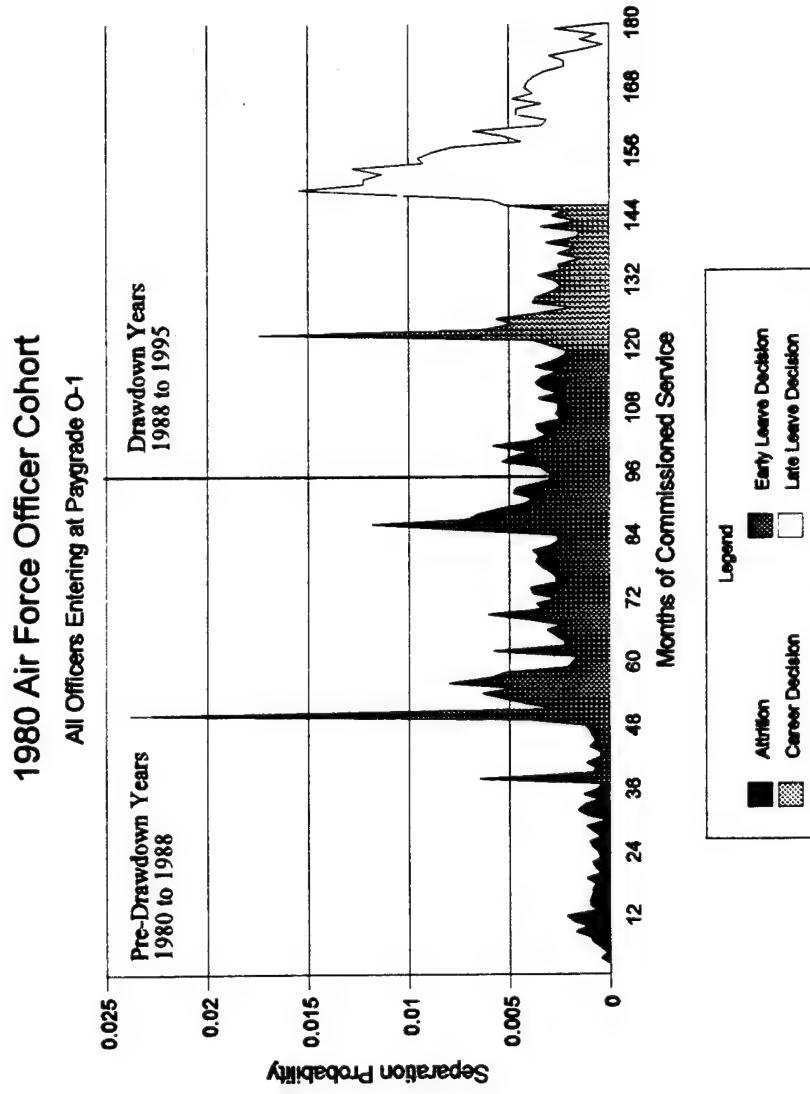
Figure 10. 1980 Air Force Officer Cohort – Separation Probability Density Function
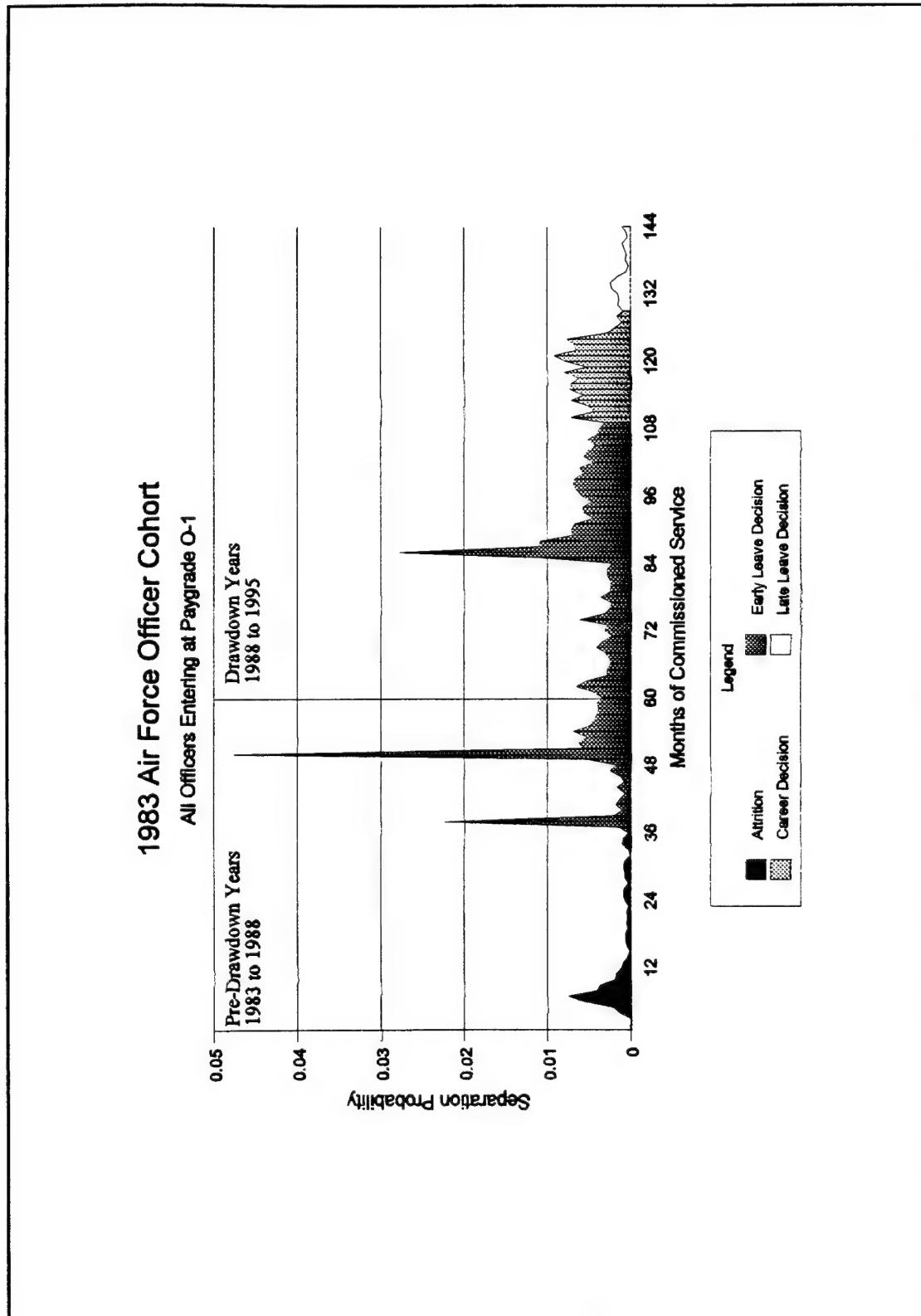
Figure 11. 1983 Air Force Officer Cohort – Separation Probability Density Function
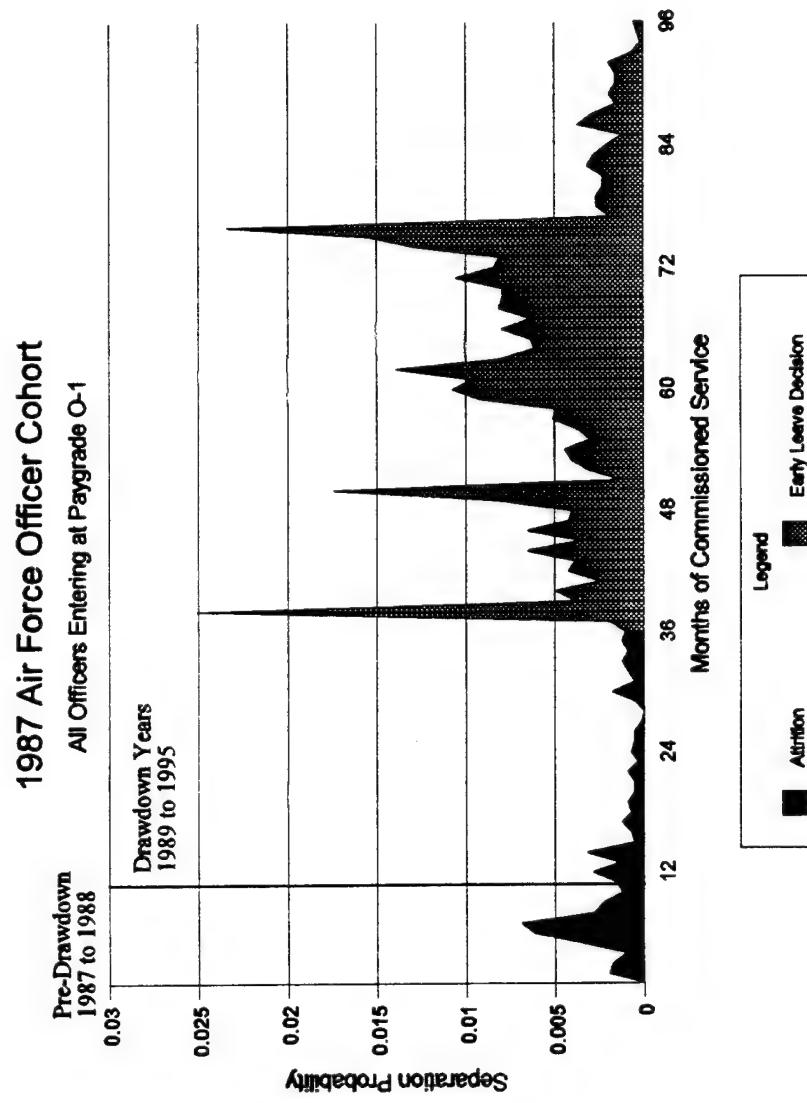
Figure 12. 1987 Air Force Officer Cohort – Separation Probability Density Function
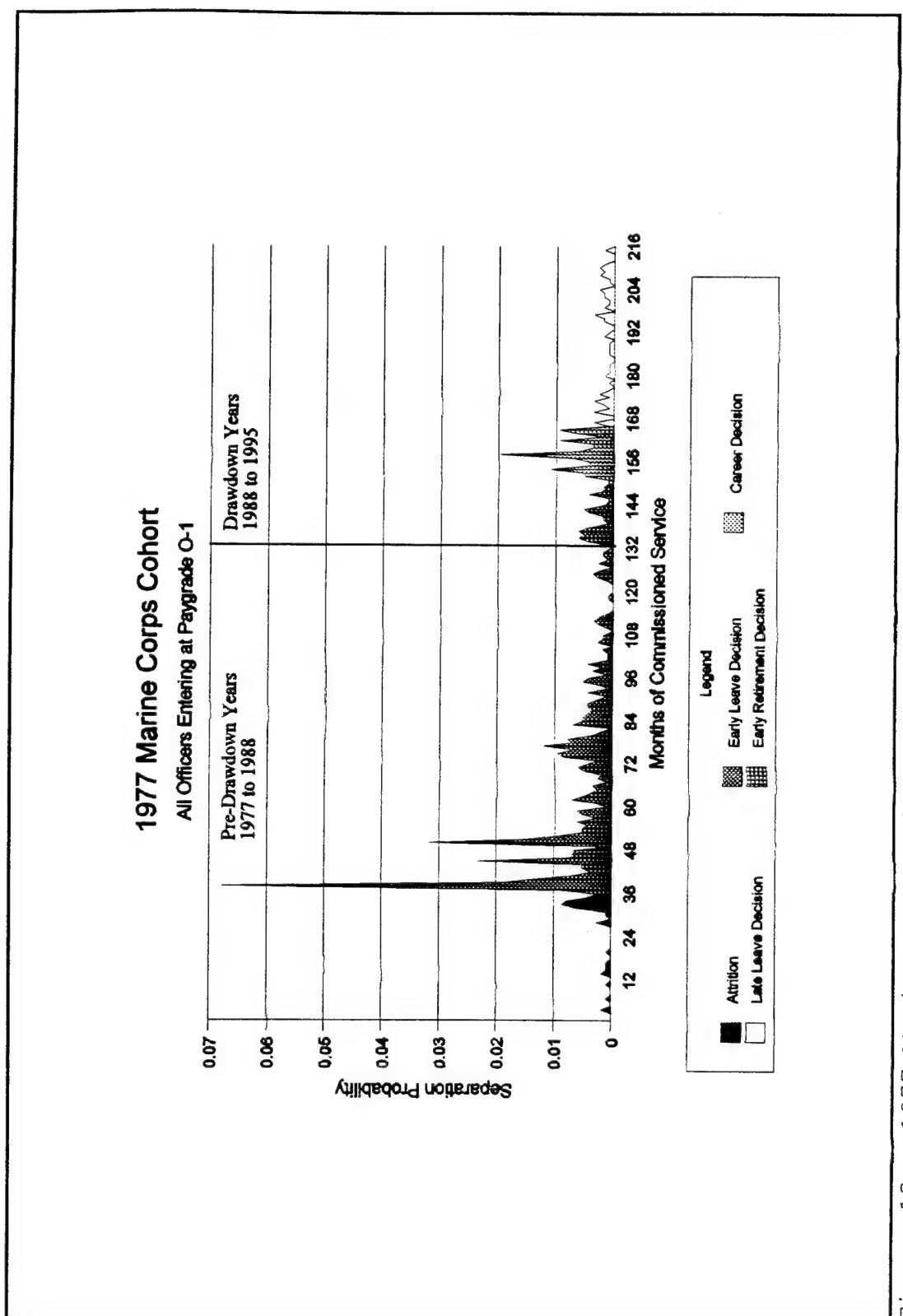
Figure 13. 1977 Marine Corps Officer Cohort – Separation Probability Density Function

Figure 14. 1980 Marine Corps Officer Cohort – Separation Probability Density Function
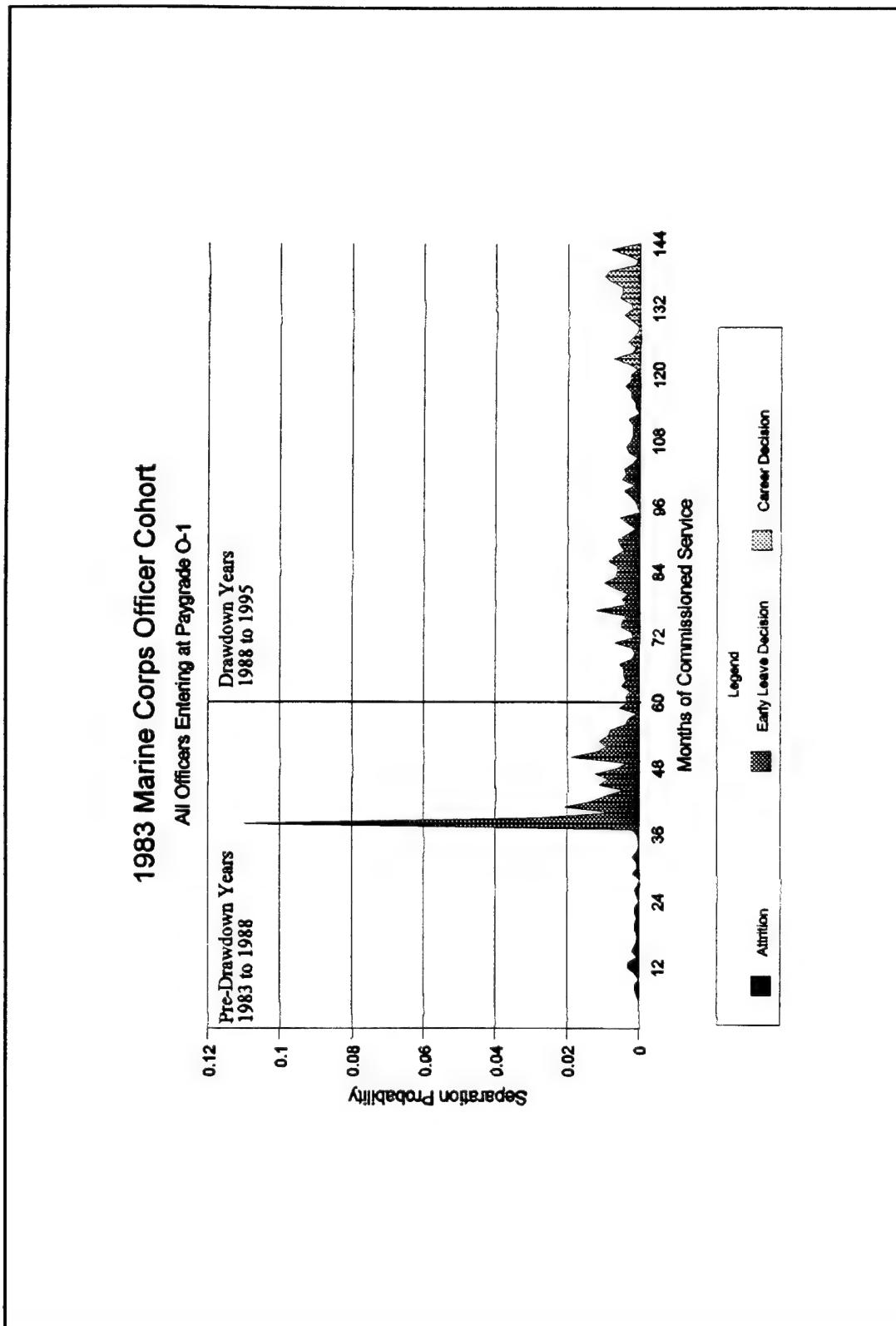
Figure 15.   1983 Marine Corps Officer Cohort – Separation Probability Density Function
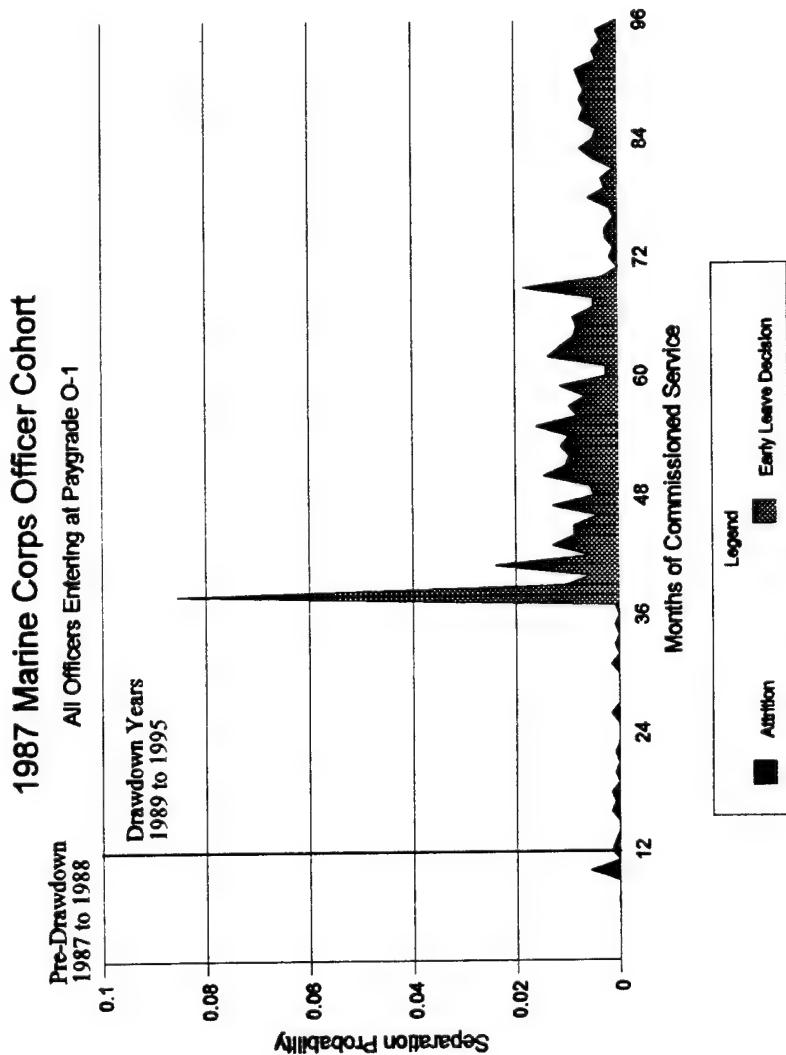
Figure 16. 1987 Marine Corps Officer Cohort - Separation Probability Density Function

APPENDIX C.   RESULTS OF MULTIVARIATE MODELS

This appendix contains the results of the log-linear and logistic multivariate regression models described and evaluated in Chapters III and IV.   The models were estimated for each identifiable phase of separation behavior, by service and by year.   Statistical significance for each variable is indicated by the chi-square value for the log-linear models, and the Wald chi-square value for the logistic regression models, compared with the critical values listed below:

- $\geq$ 6.6358 indicates significance at the .01 level;
- $\geq$ 3.8416 indicates significance at the .05 level;
- $\geq$ 2.7060 indicates significance at the .10 level; and
- $\geq$ 1.6435 indicates significance at the .20 level.

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.1023	-1.1452	4.1468	0.3883	1.8736	0.0085	38.0
HISPANIC	0.0263	-2.6361	10.9914	1.1559	7.9893	0.0252	113.0
OTHMINOR	0.0317	-0.4182	0.1876	0.1736	0.1253	0.0038	17.0
FEMALE	0.1273	-2.4956	19.3718	1.0373	14.2932	0.0226	101.4
NUMDEPS	0.6833	0.1559	0.3947	-0.1247	1.0601	-0.0027	-12.2
ENLSVC	0.0536	-2.2895	3.2001	0.9018	1.9640	0.0197	88.2
ENTRYAGE	22.7428	-0.5430	35.5353	0.2365	28.8836	0.0052	23.1
ACAD	0.1903	-6.3010	95.5920	2.7767	147.689	0.0605	271.5
POSTGRAD	0.0504	0.4779	0.2383	-0.3930	0.6361	-0.0086	-38.4
NODEG	0.0536	-1.3120	1.5906	0.7260	2.1100	0.0158	71.0
OPERATNL	0.3367	2.4214	19.6138	-1.0863	18.2928	-0.0237	-106.2
Observations (N=)		5560		5560			
Leavers		124		124			
Base Probability of Leaving		not applicable		0.0223			
Log Likelihood Ratio		-693.9456361		not applicable			
Model χ^2		not applicable		219.102			
Concordant Ratio		not applicable		82.6			

Table C1.   1977 Army "Attrition Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.1025	0.1551	5.1242	-0.2983	7.8004	-0.0746	-15.0
HISPANIC	0.0255	-0.1953	2.5859	0.1139	0.3176	0.0285	5.7
OTHMINOR	0.0312	-0.0142	0.0167	0.0013	0.0000	0.0003	0.1
FEMALE	0.1252	0.2772	22.5932	-0.3854	13.5167	-0.0963	-19.4
NUMDEPS	1.6381	0.4736	693.0711	-0.6197	556.189	-0.1549	-31.2
ENLSVC	0.0225	0.2108	1.4303	-0.6870	7.0640	-0.1717	-34.5
ENTRYAGE	22.7301	-0.0554	25.3070	0.0845	22.6541	0.0211	4.2
ACAD	0.1806	-0.5046	98.5232	0.6483	54.5762	0.1621	32.6
POSTGRAD	0.2221	1.2679	408.3451	-1.4888	323.408	-0.3722	-74.8
NODEG	0.0173	-1.2379	114.8116	2.7775	51.8682	0.6944	139.6
OPERATNL	0.3985	0.9787	429.7326	-1.2848	323.665	-0.3212	-64.6
Observations (N=)		5377		5377			
Leavers		2674		2674			
Base Probability of Leaving		not applicable		0.4973			
Log Likelihood Ratio		-6161.406636		not applicable			
Model χ^2		not applicable		1668.868			
Concordant Ratio		not applicable		80.4			

Table C2.   1977 Army "Early Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.1136	−0.1942	7.4869	0.3457	6.2028	0.0617	26.5
HISPANIC	0.0241	0.0049	0.0009	−0.0249	0.0067	−0.0044	−1.9
OTHMINOR	0.0290	−0.3500	8.0555	0.6863	7.4191	0.1224	52.7
FEMALE	0.0872	0.1368	1.9829	−0.2359	1.6600	−0.0421	−18.1
NUMDEPS	2.3018	0.0552	8.9237	−0.1049	9.3399	−0.0187	−8.1
ENLSVC	0.0319	−0.5413	20.3804	0.5641	5.3647	0.1006	43.3
ENTRYAGE	22.6978	−0.0425	11.8483	0.0595	6.4130	0.0106	4.6
ACAD	0.1518	0.3684	14.6385	−0.6597	15.4023	−0.1177	−50.6
POSTGRAD	0.3768	0.5240	67.1939	−0.9048	67.5184	−0.1614	−69.5
NODEG	0.0026	−0.4377	1.9173	0.8573	1.2143	0.1529	65.8
OPERATNL	0.5568	0.0355	0.4380	−0.0369	0.1299	−0.0066	−2.8
Observations (N=)		2694		2694			
Leavers		626		626			
Base Probability of Leaving		not applicable		0.2324			
Log Likelihood Ratio		−1743.950475		not applicable			
Model χ^2		not applicable		150.026			
Concordant Ratio		not applicable		64.6			

Table C3. 1977 Army "Career Decision Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.1024	0.1160	0.4009	-0.2278	0.3773	-0.0102	-21.7
HISPANIC	0.0243	0.1175	0.1006	-0.2612	0.1189	-0.0117	-24.9
OTHMINOR	0.0247	0.1180	0.1012	-0.2222	0.0900	-0.0100	-21.2
FEMALE	0.0873	0.0377	0.0317	-0.1017	0.0582	-0.0046	-9.7
NUMDEPS	2.5618	0.0332	0.7083	-0.0713	0.8124	-0.0032	-6.8
ENLSVC	0.0271	-1.3796	56.8180	2.4101	50.7996	0.1081	229.7
ENTRYAGE	22.6400	-0.0009	0.0010	-0.0136	0.0555	-0.0006	-1.3
ACAD	0.1742	-0.2147	2.0439	0.4263	2.0483	0.0191	40.6
POSTGRAD	0.5570	0.3298	8.4875	-0.6186	7.6757	-0.0277	-58.9
NODEG	0.0000	-------	--------	-------	-------	------	------
OPERATNL	0.5012	0.2311	4.1941	-0.4579	4.0726	-0.0205	-43.6
Observations (N=)		2061		2061			
Leavers		97		97			
Base Probability of Leaving		not applicable		0.0471			
Log Likelihood Ratio		-397.4534214		not applicable			
Model χ^2		not applicable		54.270			
Concordant Ratio		not applicable		64.7			

Table C4.   1977 Army "Late Decision Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.1040	−0.1057	2.8928	0.3386	2.7461	0.0417	29.0
HISPANIC	0.0243	−0.1066	0.7723	0.3577	0.8151	0.0441	30.6
OTHMINOR	0.0243	0.1680	0.8735	−0.5264	0.9083	−0.0648	−45.1
FEMALE	0.0870	−0.0630	0.6041	0.1753	0.4671	0.0216	15.0
NUMDEPS	2.6915	−0.0164	1.2054	0.0408	0.6921	0.0050	3.5
ENLSVC	0.0202	−0.8269	103.9034	2.9853	60.5629	0.3678	255.6
ENTRYAGE	22.6341	−0.7185	50.8624	0.2233	46.5729	0.0275	19.1
ACAD	0.1739	0.0031	0.0018	0.0020	0.0001	0.0002	0.2
POSTGRAD	0.6501	0.2643	32.7393	−0.8016	31.7502	−0.0987	−68.6
NODEG	0.0016	−0.5728	4.8658	2.1376	2.5352	0.2633	183.0
OPERATNL	0.5171	0.0192	0.1782	−0.0608	0.1677	−0.0075	−5.2
Observations (N=)		1932		1932			
Leavers		278		278			
Base Probability of Leaving		not applicable		0.1439			
Log Likelihood Ratio		−727.2524565		not applicable			
Model χ^2		not applicable		165.175			
Concordant Ratio		not applicable		69.1			

Table C5.   1977 Army "Early Retirement Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0727	−0.9133	10.1558	0.5561	12.5403	0.0258	52.9
HISPANIC	0.0073	−0.0513	0.0022	−0.0073	0.0001	−0.0003	−0.7
OTHMINOR	0.1069	−0.8241	9.6190	0.4848	11.2222	0.0225	46.1
ASIAN/PI	0.0062	−2.0151	9.3175	1.1290	8.3925	0.0524	107.4
FEMALE	0.1399	−0.3139	1.7803	0.0994	0.5845	0.0046	9.5
NUMDEPS	1.1306	0.2588	9.7065	−0.1324	8.7252	−0.0061	−12.6
ENLSVC	0.0357	3.8889	12.1463	−1.9762	11.3246	−0.0917	−188.0
ENTRYAGE	23.3715	−0.1977	47.0352	0.1069	48.4043	0.0050	10.2
ACAD	0.0978	2.6135	19.1796	−1.2929	17.0797	−0.0600	−123.0
POSTGRAD	0.1667	0.5246	3.8736	−0.3912	7.2102	−0.0182	−37.2
NODEG	0.1418	1.0475	6.4251	−0.6492	8.6517	−0.0301	−61.8
OPERATNL	0.3084	0.8745	11.8214	−0.4645	11.6541	−0.0216	−44.2
Observations (N=)		9015		9015			
Leavers		440		440			
Base Probability of Leaving		not applicable		0.0488			
Log Likelihood Ratio		−2353.438391		not applicable			
Model χ^2		not applicable		203.664			
Concordant Ratio		not applicable		68.6			

Table C6.   1980 Army "Attrition Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0752	0.3568	19.9701	-0.4322	14.1219	-0.1079	-22.3
HISPANIC	0.0040	-0.3706	1.5954	0.6690	1.8419	0.1671	34.5
OTHMINOR	0.0497	-0.2256	6.3535	0.2483	3.1643	0.0620	12.8
ASIAN/PI	0.0027	0.1209	0.0854	-0.3405	0.3483	-0.0850	-17.6
FEMALE	0.1558	0.1633	9.1344	-0.1809	4.0936	-0.0452	-9.3
NUMDEPS	1.6130	0.4450	617.3159	-0.5390	489.009	-0.1346	-27.8
ENLSVC	0.0486	0.4481	13.1093	-0.5637	12.0458	-0.1408	-29.1
ENTRYAGE	22.8497	-0.0575	31.1100	0.0811	25.6339	0.0203	4.2
ACAD	0.1545	-0.0772	1.7363	0.2294	6.9227	0.0573	11.8
POSTGRAD	0.1807	1.1135	267.6754	-1.2341	210.055	-0.3082	-63.7
NODEG	0.0069	-0.8759	18.7911	1.1691	8.6870	0.2920	60.3
OPERATNL	0.4352	0.5837	167.7667	-0.7593	133.003	-0.1896	-39.2
Observations (N=)		5489		5489			
Leavers		2657		2657			
Base Probability of Leaving		not applicable		0.4841			
Log Likelihood Ratio		-6366.160533		not applicable			
Model χ^2		not applicable		1102.353			
Concordant Ratio		not applicable		75.0			

Table C7. 1980 Army "Early Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0842	0.0436	0.3643	-0.0836	0.2921	-0.0178	-5.8
HISPANIC	0.0036	0.0796	0.0574	-0.2291	0.1033	-0.0487	-15.9
OTHMINOR	0.0481	-0.2138	7.0319	0.4399	5.4448	0.0935	30.5
ASIAN/PI	0.0033	-0.2647	0.8485	0.5062	0.5216	0.1075	35.1
FEMALE	0.1186	-0.1369	4.0725	0.2603	3.1781	0.0553	18.1
NUMDEPS	2.3156	-0.0029	0.0362	0.0030	0.0087	0.0006	0.2
ENLSVC	0.0669	-0.1691	5.1305	0.2639	2.2995	0.0561	18.3
ENTRYAGE	22.8778	-0.0451	25.2769	0.0956	21.6626	0.0203	6.6
ACAD	0.1609	0.2428	12.5339	-0.4735	12.0070	-0.1006	-32.9
POSTGRAD	0.3644	0.4343	78.2309	-0.8548	78.0182	-0.1816	-59.3
NODEG	0.0061	-0.3529	3.9775	0.9513	3.3767	0.2021	66.0
OPERATNL	0.5513	-0.0875	4.1260	0.1946	4.4066	0.0413	13.5
Observations (N=)		2766		2766			
Leavers		847		847			
Base Probability of Leaving		not applicable		0.3062			
Log Likelihood Ratio		-2069.988837		not applicable			
Model χ^2		not applicable		171.082			
Concordant Ratio		not applicable		64.3			

Table C8.   1980 Army "Career Decision Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0842	0.0215	0.0058	0.0114	0.0004	0.0003	1.1
HISPANIC	0.0037	-0.3737	0.4869	0.5584	0.2092	0.0133	54.5
OTHMINOR	0.0408	-0.3387	1.4865	0.7867	1.7172	0.0187	76.8
ASIAN/PI	0.0026	-0.4350	0.6535	0.9813	0.5417	0.0233	95.7
FEMALE	0.1143	-0.1054	0.1787	0.1877	0.1320	0.0045	18.3
NUMDEPS	2.4494	0.0739	1.3940	-0.1438	1.2721	-0.0034	-14.0
ENLSVC	0.0524	-1.4148	27.7771	2.8678	55.1853	0.0681	279.8
ENTRYAGE	22.6824	-0.0337	1.5919	0.0564	1.0223	0.0013	5.5
ACAD	0.1879	0.3138	0.6444	-0.6143	0.6573	-0.0146	-59.9
POSTGRAD	0.5738	0.3427	4.2508	-0.6880	4.2986	-0.0163	-67.1
NODEG	0.0011	10.7465	0.0000	-90.614	-------	-------	------
OPERATNL	0.5236	0.1758	1.0679	-0.3435	0.9652	-0.0082	-33.5
Observations (N=)		1889		1889			
Leavers		46		46			
Base Probability of Leaving		not applicable		0.0244			
Log Likelihood Ratio		-186.6044753		not applicable			
Model χ^2		not applicable		94.666			
Concordant Ratio		not applicable		79.4			

Table C9.   1980 Army "Late Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.1067	-1.0335	18.7745	0.5650	16.7513	0.0269	53.7
HISPANIC	0.0090	0.9507	0.5573	-0.5724	0.6263	-0.0273	-54.4
OTHMINOR	0.0355	0.9245	2.0624	-0.4511	1.5079	-0.0215	-42.8
ASIAN/PI	0.0063	1.6077	0.7994	-0.9976	0.9650	-0.0475	-94.8
FEMALE	0.1470	-0.3832	2.6247	0.1609	1.3636	0.0077	15.3
NUMDEPS	1.1554	0.3772	19.0852	-0.1929	15.8687	-0.0092	-18.3
ENLSVC	0.0417	1.5816	7.2821	-0.7556	5.1550	-0.0360	-71.8
ENTRYAGE	23.7384	-0.1702	37.0520	0.1031	42.6420	0.0049	9.8
ACAD	0.1099	4.0483	23.5264	-2.0690	20.4677	-0.0986	-196.5
POSTGRAD	0.1574	1.0200	12.4447	-0.5975	12.8338	-0.0285	-56.8
NODEG	0.1547	-0.2648	0.7329	0.2378	1.7898	0.0113	22.6
OPERATNL	0.4563	0.5509	6.4678	-0.3455	7.7876	-0.0165	-32.8
Observations (N=)		7797		7797			
Leavers		391		391			
Base Probability of Leaving		not applicable		0.0501			
Log Likelihood Ratio		-2062.891759		not applicable			
Model χ^2		not applicable		162.616			
Concordant Ratio		not applicable		153.170			

Table C10.   1983 Army "Attrition Phase" Separation Models

133

Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.1247	-0.0458	1.0018	0.1445	1.8718	0.0315	4.6
HISPANIC	0.0078	-0.0102	0.0035	0.0834	0.0501	0.0182	2.7
OTHMINOR	0.0396	0.1622	3.8725	-0.1445	0.7754	-0.0315	-4.6
ASIAN/PI	0.0062	-0.5100	8.6632	0.8337	2.1790	0.1816	26.7
FEMALE	0.1621	-0.0283	0.4317	0.2348	5.0360	0.0511	7.5
NUMDEPS	1.4209	0.2850	473.1483	-0.4100	254.477	-0.0893	-13.1
ENLSVC	0.0577	0.5333	41.3267	-0.8060	32.6364	-0.1756	-25.8
ENTRYAGE	23.2944	-0.0139	4.5672	0.0411	8.5001	0.0090	1.3
ACAD	0.1676	0.6126	165.0553	-0.7827	73.2496	-0.1705	-25.1
POSTGRAD	0.1284	0.9614	269.9677	-1.3123	191.677	-0.2859	-42.1
NODEG	0.0094	-0.6329	19.7368	1.0512	5.8153	0.2290	33.7
OPERATNL	0.4860	-0.1060	9.8318	0.1508	4.1724	0.0329	4.8
Observations (N=)	4868			4868			
Leavers	3307			3307			
Base Probability of Leaving	not applicable			0.6793			
Log Likelihood Ratio	-6309.909316			not applicable			
Model χ^2	not applicable			702.176			
Concordant Ratio	not applicable			72.9			

Table C11.   1983 Army "Early Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.1012	-0.1694	2.6311	0.2902	2.1429	0.0564	21.3
HISPANIC	0.0066	-0.3922	1.6061	0.7311	1.1518	0.1422	53.8
OTHMINOR	0.0473	0.0448	0.0579	-0.0776	0.0571	-0.0151	-5.7
ASIAN/PI	0.0029	-1.0814	4.8802	1.7658	2.7383	0.3434	129.9
FEMALE	0.1085	0.2418	3.5411	-0.3694	2.7006	-0.0718	-27.2
NUMDEPS	2.1748	0.0505	3.5783	-0.0876	3.3453	-0.0170	-6.4
ENLSVC	0.1071	0.0497	0.1791	-0.0973	0.2113	-0.0189	-7.2
ENTRYAGE	23.4479	0.0093	0.4582	-0.0135	0.3008	-0.0026	-1.0
ACAD	0.2272	0.8332	38.0991	-1.3544	40.3113	-0.2634	-99.6
POSTGRAD	0.4341	0.6381	52.3758	-1.0407	54.0688	-0.2024	-76.6
NODEG	0.0000	-------	--------	-------	-------	0.0000	0.0
OPERATNL	0.4749	-0.0659	0.7349	0.1232	0.7634	0.0240	9.1
Observations (N=)		1373		1373			
Leavers		363		363			
Base Probability of Leaving		not applicable		0.2644			
Log Likelihood Ratio		-980.2707236		not applicable			
Model χ^2		not applicable		134.914			
Concordant Ratio		not applicable		69.6			

Table C12.   1983 Army "Career Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.1244	-0.4410	1.4933	0.2952	2.4218	0.0134	28.1
HISPANIC	0.0177	-1.3457	3.5147	0.7120	3.4015	0.0322	67.8
OTHMINOR	0.0166	2.7690	1.9517	-1.4327	1.9957	-0.0648	-136.5
ASIAN/PI	0.0162	0.1946	0.0289	-0.1141	0.0364	-0.0052	-10.9
FEMALE	0.1874	-1.1731	9.8986	0.4690	5.8821	0.0212	44.7
NUMDEPS	0.6720	0.4949	9.3591	-0.2335	7.8499	-0.0106	-22.2
ENLSVC	0.0447	0.1200	0.0340	0.0421	0.0151	0.0019	4.0
ENTRYAGE	23.1318	-0.2103	14.7464	0.1108	15.2486	0.0050	10.6
ACAD	0.2158	2.3118	19.5732	-1.2314	22.6435	-0.0557	-117.3
POSTGRAD	0.0181	1.4534	1.5509	-0.6504	1.1539	-0.0294	-62.0
NODEG	0.0081	-1.6536	1.8639	0.8556	1.7846	0.0387	81.5
OPERATNL	0.5370	-1.4477	19.7244	0.7173	18.9064	0.0325	68.3
Observations (N=)		4695		4695			
Leavers		223		223			
Base Probability of Leaving		not applicable		0.0475			
Log Likelihood Ratio		-1216.513562		not applicable			
Model χ^2		not applicable		78.947			
Concordant Ratio		not applicable		65.6			

Table C13.   1987 Army "Attrition Phase" Separation Models

Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.1206	0.3184	11.6384	-0.3007	8.7869	-0.0750	-15.7
HISPANIC	0.0170	-0.0809	0.1253	0.0943	0.1300	0.0235	4.9
OTHMINOR	0.0175	0.0370	0.0292	-0.0448	0.0312	-0.0112	-2.3
ASIAN/PI	0.0166	0.2997	1.6740	-0.2989	1.3574	-0.0746	-15.6
FEMALE	0.1832	-0.4316	31.8728	0.5235	31.7884	0.1306	27.4
NUMDEPS	1.2257	0.5751	351.5270	-0.5397	306.338	-0.1346	-28.2
ENLSVC	0.0450	0.6758	11.1101	-0.5918	9.3381	-0.1476	-31.0
ENTRYAGE	23.1020	-0.0312	4.4943	0.0416	6.3647	0.0104	2.2
ACAD	0.2207	-0.1244	2.9898	0.1473	2.9776	0.0367	7.7
POSTGRAD	0.0702	1.7704	90.6214	-1.5802	92.8115	-0.3942	-82.7
NODEG	0.0050	-0.3969	0.8201	0.5436	1.3077	0.1356	28.4
OPERATNL	0.4594	-0.2136	10.2161	0.1963	6.9794	0.0490	10.3
Observations (N=)		4404		4404			
Leavers		2100		2100			
Base Probability of Leaving		not applicable		0.4768			
Log Likelihood Ratio		-5723.03746		not applicable			
Model χ^2		not applicable		653.877			
Concordant Ratio		not applicable		71.1			

Table C14.   1987 Army "Early Decision Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0399	-1.5139	3.2281	0.5793	2.5548	0.0195	55.9
HISPANIC	0.0130	1.6176	0.4416	-0.6407	0.3952	-0.0215	-61.8
OTHMINOR	0.0118	-0.4761	0.0760	0.2204	0.0891	0.0074	21.3
FEMALE	0.0997	0.6374	0.5336	-0.2382	0.4158	-0.0080	-23.0
NUMDEPS	0.8511	0.9600	11.7096	-0.3708	10.4047	-0.0125	-35.8
ENLSVC	0.0508	-0.4643	0.1811	0.1711	0.1363	0.0057	16.5
ENTRYAGE	21.9506	-0.4992	22.6581	0.2073	23.3552	0.0070	20.0
ACAD	0.1990	-1.6756	11.9423	0.7513	14.3503	0.0252	72.5
POSTGRAD	0.0290	-0.5115	0.3197	0.1611	0.1700	0.0054	15.5
NODEG	0.0962	0.2666	0.0628	-0.1308	0.0840	-0.0044	-12.6
OPERATNL	0.2570	5.8504	23.9286	-2.4603	28.7553	-0.0826	-237.5
Observations (N=)		4312		4312			
Leavers		150		150			
Base Probability of Leaving		not applicable		0.0348			
-Log Likelihood Ratio		-871.5427625		not applicable			
Model χ^2		not applicable		118.157			
Concordant Ratio		not applicable		72.2			

Table C15.   1977 Navy "Attrition Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0379	−0.2452	4.8914	0.2213	1.4669	0.0547	12.2
HISPANIC	0.0134	0.0158	0.0062	−0.1046	0.1128	−0.0259	−5.8
OTHMINOR	0.0012	−0.1135	0.3958	0.2009	0.4034	0.0497	11.1
FEMALE	0.0967	0.3230	9.4991	−0.5130	9.0674	−0.1269	−28.3
NUMDEPS	1.5632	0.3693	335.2326	−0.4898	273.099	−0.1212	−27.0
ENLSVC	0.0502	0.0399	0.0900	0.0836	0.1472	0.0207	4.6
ENTRYAGE	21.9020	−0.0566	23.2250	0.0977	27.6107	0.0242	5.4
ACAD	0.1999	0.1266	5.3215	0.0203	0.0526	0.0050	1.1
POSTGRAD	0.1457	1.3745	193.5488	−1.7138	194.552	−0.4240	−94.5
NODEG	0.0853	0.3424	10.3079	−0.6091	16.9178	−0.1507	−33.6
OPERATNL	0.2817	0.2990	35.1866	−0.4031	25.7226	−0.0997	−22.2
Observations (N=)		3961		3961			
Leavers		1778		1778			
Base Probability of Leaving		not applicable		0.4489			
Log Likelihood Ratio		−4218.318805		not applicable			
Model χ^2		not applicable		719.541			
Concordant Ratio		not applicable		73.3			

Table C16.   1977 Navy "Early Decision Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0365	−0.3774	9.0877	0.6210	5.6926	0.1025	49.1
HISPANIC	0.0148	−0.0959	0.1968	0.2689	0.3847	0.0444	21.3
OTHMINOR	0.0097	−0.0869	0.1018	0.1860	0.1196	0.0307	14.7
FEMALE	0.0890	0.2757	3.6800	−0.4031	2.0965	−0.0665	−31.9
NUMDEPS	2.1518	0.1027	20.9700	−0.2037	22.6259	−0.0336	−16.1
ENLSVC	0.0443	0.2545	1.4819	−0.4882	1.5751	−0.0806	−38.6
ENTRYAGE	21.6636	0.0642	18.5192	−0.0946	12.4153	−0.0156	−7.5
ACAD	0.1924	0.3138	11.9534	−0.4242	6.6407	−0.0700	−33.6
POSTGRAD	0.2893	0.4762	32.7470	−0.7511	25.9678	−0.1240	−59.4
NODEG	0.1089	−0.3270	14.0501	0.6276	12.7315	0.1036	49.7
OPERATNL	0.4592	0.2541	13.3169	−0.3982	9.2953	−0.0657	−31.5
Observations (N=)		2167		2167			
Leavers		452		452			
Base Probability of Leaving		not applicable		0.2086			
Log Likelihood Ratio		−1272.179242		not applicable			
Model χ^2		not applicable		148.146			
Concordant Ratio		not applicable		67.8			

Table C17.   1977 Navy "Career Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0316	-0.1771	1.5930	0.2969	0.6701	0.0398	25.0
HISPANIC	0.0141	0.5929	1.6892	-1.3027	1.5120	-0.1744	-109.5
OTHMINOR	0.0094	0.3446	0.5722	-0.7201	0.4602	-0.0964	-60.5
FEMALE	0.0913	0.3400	3.0549	-0.7593	2.7263	-0.1017	-63.8
NUMDEPS	2.3905	0.0019	0.0088	-0.0079	0.0225	-0.0011	-0.7
ENLSVC	0.0474	0.1925	0.4308	-0.5166	0.5773	-0.0692	-43.4
ENTRYAGE	21.8214	0.1385	72.5262	-0.3225	73.0214	-0.0432	-27.1
ACAD	0.2102	0.4776	19.8326	-1.0068	17.2651	-0.1348	-84.6
POSTGRAD	0.4438	0.3827	28.7623	-0.9062	28.0447	-0.1213	-76.2
NODEG	0.0679	0.0461	0.2764	-0.0891	0.1240	-0.0119	-7.5
OPERATNL	0.4696	0.1533	5.4681	-0.4176	6.2492	-0.0559	-35.1
Observations (N=)		1708		1708			
Leavers		272		272			
Base Probability of Leaving		not applicable		0.1593			
Log Likelihood Ratio		-705.7138941		not applicable			
Model χ^2		not applicable		223.240			
Concordant Ratio		not applicable		76.2			

Table C18.   1977 Navy "Late Decision Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0300	−0.1226	2.1258	0.3960	1.3963	0.0794	28.6
HISPANIC	0.0160	0.0815	0.3849	−0.2359	0.2288	−0.0473	−17.0
OTHMINOR	0.0105	0.0253	1.2498	−0.8967	1.3482	−0.1797	−64.8
FEMALE	0.1017	0.0852	1.0582	−0.3327	1.1857	−0.0667	−24.0
NUMDEPS	2.4997	0.0007	0.0029	0.0012	0.0007	0.0002	0.1
ENLSVC	0.0537	−0.0392	0.1457	0.1514	0.1582	0.0303	10.9
ENTRYAGE	22.0975	−0.0224	8.6570	0.0832	7.8034	0.0167	6.0
ACAD	0.2348	0.1966	16.7025	−0.7044	17.5848	−0.1412	−50.9
POSTGRAD	0.5624	0.1528	18.7985	−0.5463	17.4497	−0.1095	−39.5
NODEG	0.0425	−0.1370	3.4751	0.4969	2.7015	0.0996	35.9
OPERATNL	0.4808	0.0240	0.4285	−0.0713	0.2630	−0.0143	−5.2
Observations (N=)		1435		1435			
Leavers		398		398			
Base Probability of Leaving		not applicable		0.2774			
Log Likelihood Ratio		−790.8001802		not applicable			
Model χ^2		not applicable		60.496			
Concordant Ratio		not applicable		62.3			

Table C19. 1977 Navy "Early Retirement Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0368	−2.0186	16.6594	1.1141	16.0010	0.0371	107.6
HISPANIC	0.0119	−1.6354	3.0672	0.8600	2.5712	0.0286	83.0
OTHMINOR	0.0079	−2.4805	6.9839	1.2389	5.1640	0.0412	119.6
ASIAN/PI	0.0163	−0.1987	0.0234	−0.0049	0.0000	−0.0002	−0.5
FEMALE	0.1303	0.6358	2.7341	−0.3100	2.0584	−0.0103	−29.9
NUMDEPS	1.0133	0.2788	4.1011	−0.1367	3.2093	−0.0046	−13.2
ENLSVC	0.1826	1.0769	3.3345	−0.5412	2.6950	−0.0180	−52.3
ENTRYAGE	22.5422	−0.1567	11.6027	0.0898	12.2629	0.0030	8.7
ACAD	0.1316	2.7967	14.5401	−1.4587	13.6705	−0.0486	−140.8
POSTGRAD	0.1042	0.5142	1.4011	−0.4030	2.7131	−0.0134	−38.9
NODEG	0.0621	1.6689	2.3077	−1.0473	3.0082	−0.0349	−101.1
OPERATNL	0.2256	1.6184	12.8315	−0.9674	15.7426	−0.0322	−93.4
Observations (N=)		5510		5510			
Leavers		190		190			
Base Probability of Leaving		not applicable		0.0345			
Log Likelihood Ratio		−1075.67513		not applicable			
Model χ^2		not applicable		98.728			
Concordant Ratio		not applicable		69.0			

Table C20.   1980 Navy "Attrition Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0302	-0.0418	0.1374	0.0904	0.1921	0.0226	4.7
HISPANIC	0.0111	0.2183	1.0753	-0.4665	1.7577	-0.1165	-24.0
OTHMINOR	0.0067	0.0907	0.1340	0.0382	0.0073	0.0095	2.0
ASIAN/PI	0.0164	-0.5287	14.0352	0.9050	9.4185	0.2260	46.6
FEMALE	0.1247	0.8324	167.8106	-1.1337	94.7499	-0.2832	-58.4
NUMDEPS	1.5096	0.3449	369.8653	-0.4634	243.399	-0.1157	-23.9
ENLSVC	0.1464	1.0652	110.0512	-1.6145	126.036	-0.4033	-83.2
ENTRYAGE	22.3304	-0.0276	8.4146	0.0588	10.5580	0.0147	3.0
ACAD	0.1688	0.0600	1.2326	0.0254	0.0659	0.0063	1.3
POSTGRAD	0.1471	1.6391	280.5773	-2.1124	277.421	-0.5276	-108.8
NODEG	0.0420	0.3151	4.7319	-0.4334	4.2946	-0.1083	-22.3
OPERATNL	0.4191	0.8062	340.5233	-1.2040	224.861	-0.3007	-62.0
Observations (N=)		4331		4331			
Leavers		2100		2100			
Base Probability of Leaving		not applicable		0.4849			
Log Likelihood Ratio		-4588.922689		not applicable			
Model χ^2		not applicable		1296.101			
Concordant Ratio		not applicable		79.8			

Table C21.   1980 Navy "Early Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0299	0.0950	0.2863	-0.0751	0.0610	-0.0133	-5.8
HISPANIC	0.0136	-0.2890	1.7616	0.5413	1.8148	0.0960	41.7
OTHMINOR	0.0072	1.1314	2.7869	-1.7036	2.6858	-0.3020	-131.1
ASIAN/PI	0.0136	-0.2415	1.1075	0.3412	0.6721	0.0605	26.3
FEMALE	0.1253	0.1539	1.9099	-0.2388	1.5875	-0.0423	-18.4
NUMDEPS	2.1448	0.0540	5.4225	-0.0826	4.4420	-0.0146	-6.4
ENLSVC	0.2394	-0.3225	12.2142	0.3326	4.3395	0.0590	25.6
ENTRYAGE	21.9905	-0.1261	0.7431	0.0279	1.2612	0.0049	2.1
ACAD	0.1656	0.1802	3.3576	-0.2840	2.9946	-0.0503	-21.9
POSTGRAD	0.3127	0.6413	55.1021	-1.0055	55.9252	-0.1782	-77.4
NODEG	0.0602	0.0278	0.0517	-0.0527	0.0599	-0.0093	-4.1
OPERATNL	0.4801	0.0767	1.1611	-0.1251	1.0509	-0.0222	-9.6
Observations (N=)		2210		2210			
Leavers		509		509			
Base Probability of Leaving		not applicable		0.2303			
Log Likelihood Ratio		-1475.017175		not applicable			
Model χ^2		not applicable		96.988			
Concordant Ratio		not applicable		63.4			

Table C22.   1980 Navy "Career Decision Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0301	0.1858	0.8277	−0.3817	0.6973	−0.0440	−33.1
HISPANIC	0.0118	0.3717	0.9729	−0.7942	0.9707	−0.0915	−68.9
OTHMINOR	0.0089	0.3188	0.7150	−0.6606	0.6458	−0.0761	−57.3
ASIAN/PI	0.0124	−0.4278	5.4932	1.0634	3.9682	0.1225	92.2
FEMALE	0.1331	−0.0007	0.0000	−0.0230	0.0046	−0.0027	−2.0
NUMDEPS	2.3892	0.0340	1.4450	−0.0758	1.4687	−0.0087	−6.6
ENLSVC	0.2203	−1.0013	65.7079	2.0657	79.4364	0.2380	179.1
ENTRYAGE	22.0289	0.0416	4.4735	−0.0720	2.8796	−0.0083	−6.2
ACAD	0.1784	0.0281	0.0354	−0.0234	0.0063	−0.0027	−2.0
POSTGRAD	0.5044	0.3886	19.0020	−0.8425	21.0786	−0.0971	−73.1
NODEG	0.0508	0.0715	0.0423	−0.0726	0.0693	−0.0084	−6.3
OPERATNL	0.4761	−0.0368	0.1829	−0.0030	0.0002	−0.0003	−0.3
Observations (N=)		1693		1693			
Leavers		225		225			
Base Probability of Leaving		not applicable		0.1329			
Log Likelihood Ratio		−624.8676949		not applicable			
Model χ^2		not applicable		283.312			
Concordant Ratio		not applicable		81.5			

Table C23.   1980 Navy "Late Decision Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0418	-1.3818	7.5223	0.6578	7.1263	0.0379	61.7
HISPANIC	0.0226	-2.1948	14.6666	1.0259	11.8219	0.0591	96.3
OTHMINOR	0.0105	-1.8858	3.4101	0.8758	3.0185	0.0505	82.2
ASIAN/PI	0.0219	-1.1803	2.6625	0.4832	1.8161	0.0278	45.4
FEMALE	0.1181	3.0917	42.0616	-1.4741	48.3514	-0.0849	-138.4
NUMDEPS	0.9953	1.0551	55.0208	-0.4672	54.3446	-0.0269	-43.9
ENLSVC	0.1708	1.7610	8.6006	-0.6985	6.6298	-0.0402	-65.6
ENTRYAGE	22.9090	-0.2832	57.6557	0.1446	63.6765	0.0083	13.6
ACAD	0.1442	6.7722	33.1770	-2.9319	33.3055	-0.1689	-275.2
POSTGRAD	0.1089	1.8720	20.3103	-1.0378	28.5356	-0.0598	-97.4
NODEG	0.0612	0.7364	0.6748	-0.4308	1.1104	-0.0248	-40.4
OPERATNL	0.2373	5.0998	55.4776	-2.4304	71.4365	-0.1400	-228.1
Observations (N=)		5979		5979			
Leavers		367		367			
Base Probability of Leaving		not applicable		0.0614			
Log Likelihood Ratio		-1814.54108		not applicable			
Model χ^2		not applicable		449.553			
Concordant Ratio		not applicable		80.2			

Table C24. 1983 Navy "Attrition Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0385	0.0989	0.9315	-0.1097	0.3916	-0.0274	-5.3
HISPANIC	0.0212	-0.1883	2.0983	0.1361	0.3411	0.0340	6.6
OTHMINOR	0.0050	-0.6564	7.0065	0.8402	3.1437	0.2099	40.7
ASIAN/PI	0.0230	-0.1652	1.7660	0.1346	0.3466	0.0336	6.5
FEMALE	0.1283	0.4002	39.2565	-0.5527	23.1043	-0.1380	-26.8
NUMDEPS	1.5289	0.3379	398.2177	-0.4430	270.326	-0.1106	-21.5
ENLSVC	0.1441	1.0426	128.4318	-1.2339	95.5208	-0.3082	-59.8
ENTRYAGE	22.6170	-0.0257	9.6075	0.0513	12.7646	0.0128	2.5
ACAD	0.1856	0.3008	32.8638	-0.3049	11.6032	-0.0762	-14.8
POSTGRAD	0.1613	1.6469	349.4641	-2.0912	354.115	-0.5223	-101.4
NODEG	0.0431	-0.1866	2.5544	-0.1737	0.8950	-0.0434	-8.4
OPERATNL	0.5422	0.2731	38.4169	-0.2528	10.1399	-0.0631	-12.3
Observations (N=)		4574		4574			
Leavers		2357		2357			
Base Probability of Leaving		not applicable		0.5153			
Log Likelihood Ratio		-5207.012002		not applicable			
Model χ^2		not applicable		1083.009			
Concordant Ratio		not applicable		76.7			

Table C25. 1983 Navy "Early Decision Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0408	-0.0733	0.1701	0.0963	0.1269	0.0149	7.8
HISPANIC	0.0204	-0.4122	3.1649	0.6010	2.6988	0.0931	48.6
OTHMINOR	0.0041	-0.1738	0.1051	0.2061	0.0629	0.0319	16.7
ASIAN/PI	0.0217	-0.3303	2.2099	0.4887	1.9663	0.0757	39.5
FEMALE	0.1200	-0.0990	0.6148	0.1652	0.7466	0.0256	13.4
NUMDEPS	2.1558	0.0671	5.9536	-0.0945	5.3702	-0.0146	-7.6
ENLSVC	0.2287	-0.1130	1.1175	0.1800	1.2299	0.0279	14.6
ENTRYAGE	22.3727	-0.0005	0.0010	0.0002	0.0001	0.0000	0.0
ACAD	0.1938	0.6483	24.7207	-0.9277	25.8490	-0.1437	-75.0
POSTGRAD	0.3628	0.4581	25.3744	-0.6540	25.7804	-0.1013	-52.9
NODEG	0.0507	0.0063	0.0014	-0.0146	0.0033	-0.0023	-1.2
OPERATNL	0.5159	-0.1478	2.7866	0.2224	2.8222	0.0344	18.0
Observations (N=)		2208		2208			
Leavers		423		423			
Base Probability of Leaving		not applicable		0.1916			
Log Likelihood Ratio		-1365.429443		not applicable			
Model χ^2		not applicable		78.247			
Concordant Ratio		not applicable		61.9			

Table C26. 1983 Navy "Career Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0406	−1.5781	7.3290	0.6503	5.1112	0.0309	61.8
HISPANIC	0.0321	−2.3750	16.7553	1.2186	16.4203	0.0579	115.8
OTHMINOR	0.0060	-------	--------	-------	-------	0.0000	0.0
ASIAN/PI	0.0210	−0.2266	0.8719	0.2082	0.2460	0.0099	19.8
FEMALE	0.0918	3.0455	20.4794	−1.4613	23.3140	−0.0695	−138.8
NUMDEPS	0.6845	1.2262	24.4098	−0.5275	22.0261	−0.0251	−50.1
ENLSVC	0.1036	3.8556	7.7559	−1.4059	5.2531	−0.0668	−133.6
ENTRYAGE	22.3764	−0.3155	20.5918	0.1771	28.2654	0.0084	16.8
ACAD	0.1933	4.7743	33.9101	−1.9754	32.0983	−0.0939	−187.7
POSTGRAD	0.0113	0.1445	0.0153	−0.0421	0.0051	−0.0020	−4.0
NODEG	0.0314	2.7520	1.4281	−1.4732	2.0464	−0.0700	−139.9
OPERATNL	0.3665	12.1413	26.1288	−5.2159	27.0041	−0.2480	−495.5
Observations (N=)		4336		4336			
Leavers		217		217			
Base Probability of Leaving		not applicable		0.0500			
Log Likelihood Ratio		−1056.676269		not applicable			
Model χ^2		not applicable		389.962			
Concordant Ratio		not applicable		84.4			

Table C27.   1987 Navy "Attrition Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0385	0.1223	0.7206	-0.1343	0.5336	-0.0333	-7.3
HISPANIC	0.0294	0.3002	3.0589	-0.3669	3.1970	-0.0911	-19.9
OTHMINOR	0.0064	-0.7222	4.9937	0.6676	2.0610	0.1657	36.2
ASIAN/PI	0.0204	0.4144	4.3482	-0.4179	2.8454	-0.1037	-22.7
FEMALE	0.0940	0.0130	0.0191	0.0100	0.0054	0.0025	0.5
NUMDEPS	1.2564	0.4554	254.4909	-0.4598	206.853	-0.1141	-24.9
ENLSVC	0.1079	1.9592	117.6114	-1.8751	106.594	-0.4654	-101.7
ENTRYAGE	22.3206	0.0545	13.3478	-0.0431	5.2898	-0.0107	-2.3
ACAD	0.2024	0.6323	72.0118	0.6330	51.8281	0.1571	34.3
POSTGRAD	0.0584	2.4058	90.9278	-2.3381	99.2931	-0.5803	-126.8
NODEG	0.0319	-0.1405	0.4556	0.0519	0.0439	0.0129	2.8
OPERATNL	0.6622	0.5949	85.5854	-0.6056	46.8810	-0.1503	-32.9
Observations (N=)		4076		4076			
Leavers		1865		1865			
Base Probability of Leaving		not applicable		0.4576			
Log Likelihood Ratio		-4872.403019		not applicable			
Model χ^2		not applicable		779.456			
Concordant Ratio		not applicable		73.7			

Table C28.   1987 Navy "Early Decision Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0812	−2.1173	17.9046	1.0941	18.4715	0.0343	105.9
HISPANIC	0.0185	−0.7745	0.5733	0.6617	1.1436	0.0208	64.0
OTHMINOR	0.0207	−2.2825	6.8978	1.2307	7.1424	0.0386	119.1
FEMALE	0.1350	−5.0408	67.5949	2.8669	58.9099	0.0899	277.4
NUMDEPS	0.9101	0.3066	1.4385	−0.1619	1.5705	−0.0051	−15.7
ENLSVC	0.0884	−2.9103	8.7785	1.9192	11.9635	0.0602	185.7
ENTRYAGE	22.3138	−0.5071	27.4361	0.2736	27.6654	0.0086	26.5
ACAD	0.1974	−8.2996	121.2753	4.5586	150.128	0.1430	441.1
POSTGRAD	0.0838	2.4905	7.2338	−1.2803	7.0347	−0.0402	−123.9
NODEG	0.0048	−1.7374	1.2768	0.7851	0.9671	0.0246	76.0
OPERATNL	0.4468	3.4280	41.6311	−1.7188	51.1310	−0.0539	−166.3
Observations (N=)		4595		4595			
Leavers		149		149			
Base Probability of Leaving		not applicable		0.0324			
Log Likelihood Ratio		−735.0383907		not applicable			
Model χ^2		not applicable		394.211			
Concordant Ratio		not applicable		88.0			

Table C29. 1977 Air Force "Attrition Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0782	0.1944	3.5994	-0.3665	6.4558	-0.0777	-25.5
HISPANIC	0.0182	0.1480	0.4499	-0.1932	0.4070	-0.0409	-13.4
OTHMINOR	0.0198	0.2567	1.4226	-0.5306	3.3334	-0.1124	-36.9
FEMALE	0.1301	-0.1717	5.5069	0.2017	3.0247	0.0427	14.0
NUMDEPS	1.7933	0.3790	245.6825	-0.4594	217.613	-0.0974	-31.9
ENLSVC	0.0917	0.6564	16.2523	-0.9850	24.9975	-0.2087	-68.5
ENTRYAGE	22.2975	0.0081	0.1898	0.0008	0.0009	0.0002	0.1
ACAD	0.1816	-0.0268	0.0129	0.1155	1.2287	0.0245	8.0
POSTGRAD	0.4444	1.6750	474.4933	-1.8464	447.435	-0.3913	-128.4
NODEG	0.0083	0.1022	0.2579	0.1484	0.1564	0.0314	10.3
OPERATNL	0.4393	0.4195	47.9961	-0.4698	30.1223	-0.0996	-32.7
Observations (N=)		4350		4350			
Leavers		1326		1326			
Base Probability of Leaving		not applicable		0.3048			
Log Likelihood Ratio		-3544.740263		not applicable			
Model χ^2		not applicable		1076.707			
Concordant Ratio		not applicable		78.7			

Table C30. 1977 Air Force "Early Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0807	−0.4469	39.7734	0.8538	31.5051	0.1381	68.0
HISPANIC	0.0198	0.0652	0.0128	−0.1548	0.1889	−0.0250	−12.3
OTHMINOR	0.0218	−0.1748	1.2419	0.2581	0.6866	0.0418	20.6
FEMALE	0.0889	0.0240	0.0739	−0.0275	0.0243	−0.0044	−2.2
NUMDEPS	2.2582	0.0547	9.3714	−0.1083	9.6860	−0.0175	−8.6
ENLSVC	0.1169	−0.4135	28.4973	0.5791	13.0338	0.0937	46.2
ENTRYAGE	22.2357	0.0371	5.1480	−0.0496	2.5900	−0.0080	−4.0
ACAD	0.1845	0.1180	2.5418	−0.1950	1.9423	−0.0315	−15.5
POSTGRAD	0.6595	0.7345	183.8539	−1.2943	175.736	−0.2094	−103.2
NODEG	0.0030	0.0721	0.0551	0.2485	0.1288	0.0402	19.8
OPERATNL	0.4486	0.1680	9.2914	−0.3043	7.9711	−0.0492	−24.3
Observations (N=)		3025		3025			
Leavers		614		614			
Base Probability of Leaving		not applicable		0.2030			
Log Likelihood Ratio		−1719.66664		not applicable			
Model χ^2		not applicable		267.267			
Concordant Ratio		not applicable		70.0			

Table C31. 1977 Air Force "Career Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0639	0.0602	0.1594	-0.2508	0.5177	-0.0186	-23.1
HISPANIC	0.0203	-0.0019	0.0001	-0.1544	0.8690	-0.0115	-14.2
OTHMINOR	0.0212	0.3279	0.9084	-0.8936	1.4069	-0.0664	-82.1
FEMALE	0.0850	-0.0301	0.0313	0.1178	0.0999	0.0088	10.8
NUMDEPS	2.5438	-0.0060	0.0512	0.0070	0.0138	0.0005	0.6
ENLSVC	0.1016	-1.0180	77.3763	2.1734	91.5683	0.1616	199.8
ENTRYAGE	22.2878	0.0629	7.1184	-0.1337	6.1407	-0.0099	-12.3
ACAD	0.1954	-0.2230	4.8370	0.4675	4.6522	0.0348	43.0
POSTGRAD	0.8183	0.3164	15.7491	-0.5455	8.7976	-0.0406	-50.1
NODEG	0.0004	8.7929	0.0000	-------	-------	-------	------
OPERATNL	0.4521	-0.0772	0.9244	0.2136	1.3544	0.0159	19.6
Observations (N=)		2411		2411			
Leavers		195		195			
Base Probability of Leaving		not applicable		0.0809			
Log Likelihood Ratio		-643.2377365		not applicable			
Model χ^2		not applicable		178.601			
Concordant Ratio		not applicable		72.6			

Table C32. 1977 Air Force "Late Decision Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0646	-0.1337	6.5233	0.4324	5.0281	0.0798	32.7
HISPANIC	0.0199	-0.0551	0.3348	0.1942	0.3131	0.0359	14.7
OTHMINOR	0.0221	-0.1784	4.5369	0.5965	3.6692	0.1101	45.1
FEMALE	0.0881	0.1411	5.4061	-0.4963	5.7677	-0.0916	-37.5
NUMDEPS	2.6545	0.0212	4.0295	-0.0772	4.3766	-0.0143	-5.8
ENLSVC	0.0741	-0.2474	24.4356	0.8118	18.7466	0.1499	61.3
ENTRYAGE	22.3695	-0.0032	0.1062	0.0168	0.2367	0.0031	1.3
ACAD	0.1956	0.0290	0.4955	-0.1128	0.6417	-0.0208	-8.5
POSTGRAD	0.8622	0.3123	76.0654	-1.0592	65.3917	-0.1956	-80.0
NODEG	0.0000	-------	-------	-------	-------	-------	-----
OPERATNL	0.4404	0.0181	0.3304	-0.0776	0.4999	-0.0143	-5.9
Observations (N=)		2214		2214			
Leavers		541		541			
Base Probability of Leaving		not applicable		0.2444			
Log Likelihood Ratio		-1174.998903		not applicable			
Model χ^2		not applicable		101.342			
Concordant Ratio		not applicable		61.9			

Table C33. 1977 Air Force "Early Retirement Phase" Separation Models

Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0713	−0.6065	2.5058	0.3332	3.0788	0.0117	32.1
HISPANIC	0.0165	3.3364	2.5470	−1.6156	2.5672	−0.0566	−155.7
OTHMINOR	0.0147	−1.1717	2.9957	0.5433	2.5191	0.0190	52.4
ASIAN/PI	0.0132	−1.2558	2.8015	0.5470	2.0807	0.0192	52.7
FEMALE	0.1916	−0.1341	0.2398	0.0098	0.0052	0.0003	0.9
NUMDEPS	1.2401	0.4674	19.3832	−0.2161	17.8851	−0.0076	−20.8
ENLSVC	0.1317	1.3991	6.6868	−0.6402	5.9921	−0.0224	−61.7
ENTRYAGE	23.5723	−0.2250	40.3459	0.1069	40.0732	0.0037	10.3
ACAD	0.0932	2.5176	9.4270	−1.1557	8.6716	−0.0405	−111.4
POSTGRAD	0.1721	0.5187	2.7071	−0.3176	4.1195	−0.0111	−30.6
NODEG	0.0150	−0.6632	1.0253	0.2107	0.4061	0.0074	20.3
OPERATNL	0.3187	2.1277	33.0998	−1.0522	34.4296	−0.0368	−101.4
Observations (N=)		9247		9247			
Leavers		336		336			
Base Probability of Leaving		not applicable		0.0363			
Log Likelihood Ratio		−1918.208631		not applicable			
Model χ^2		not applicable		189.999			
Concordant Ratio		not applicable		69.8			

Table C34. 1980 Air Force "Attrition Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	$\% \delta P$
BLACK	0.0764	0.2537	9.6661	-0.3211	7.8625	-0.0704	-21.7
HISPANIC	0.0166	-0.0366	0.0501	-0.0080	0.0012	-0.0017	-0.5
OTHMINOR	0.0120	-0.1743	0.9239	0.2689	1.0266	0.0589	18.2
ASIAN/PI	0.0120	-0.3236	4.1482	0.4244	2.8956	0.0930	28.7
FEMALE	0.1682	-0.0782	2.2232	0.2077	6.4807	0.0455	14.0
NUMDEPS	1.9175	0.2854	315.5990	-0.3695	282.148	-0.0810	-25.0
ENLSVC	0.1234	0.9410	71.0697	-1.2882	93.5552	-0.2824	-87.0
ENTRYAGE	22.6793	0.0050	0.3282	0.0117	0.8821	0.0026	0.8
ACAD	0.1205	0.0837	2.0375	0.0715	0.6507	0.0157	4.8
POSTGRAD	0.4600	1.3166	677.4385	-1.4959	578.740	-0.3279	-101.1
NODEG	0.0038	-0.6855	10.3765	0.8986	3.6259	0.1970	60.7
OPERATNL	0.3600	0.0071	0.0257	0.1777	7.5974	0.0390	12.0
Observations (N=)		6922		6922			
Leavers		2246		2246			
Base Probability of Leaving		not applicable		0.3245			
Log Likelihood Ratio		-5902.627652		not applicable			
Model χ^2		not applicable		1488.888			
Concordant Ratio		not applicable		77.2			

Table C35. 1980 Air Force "Early Decision Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0837	0.3293	10.5339	−0.5622	8.7289	−0.0627	−49.0
HISPANIC	0.0178	0.0086	0.0024	−0.0338	0.0092	−0.0038	−2.9
OTHMINOR	0.0122	0.3912	2.2136	−0.6227	1.5476	−0.0695	−54.3
ASIAN/PI	0.0105	0.4472	1.7475	−0.7771	1.6182	−0.0867	−67.8
FEMALE	0.1325	0.1625	2.7814	−0.2272	1.5948	−0.0254	−19.8
NUMDEPS	2.3601	0.0075	0.1768	−0.0240	0.5122	−0.0027	−2.1
ENLSVC	0.1663	−0.2936	25.9106	−0.4098	13.0608	−0.0457	−35.7
ENTRYAGE	22.5624	0.1556	163.1689	−0.2565	142.093	−0.0286	−22.4
ACAD	0.1070	0.4097	16.1587	−0.6052	10.7363	−0.0675	−52.8
POSTGRAD	0.6799	0.7113	186.3586	−1.0694	128.576	−0.1193	−93.3
NODEG	0.0006	−1.7346	16.4414	3.9579	9.3290	0.4417	345.1
OPERATNL	0.3233	0.1707	8.9380	−0.1713	2.4639	−0.0191	−14.9
Observations (N=)		4673		4673			
Leavers		598		598			
Base Probability of Leaving		not applicable		0.1280			
Log Likelihood Ratio		−1846.042314		not applicable			
Model χ^2		not applicable		417.216			
Concordant Ratio		not applicable		73.1			

Table C36. 1980 Air Force "Career Decision Phase" Separation Models

Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0871	0.0411	0.7501	-0.0802	0.3960	-0.0180	-5.3
HISPANIC	0.0177	-0.0349	0.1174	0.0979	0.1280	0.0220	6.5
OTHMINOR	0.0128	-0.0271	0.0625	0.1760	0.3264	0.0395	11.6
ASIAN/PI	0.0113	0.0721	0.2644	-0.3151	0.7602	-0.0707	-20.8
FEMALE	0.1406	0.0744	2.6299	-0.1714	2.1659	-0.0385	-11.3
NUMDEPS	2.4690	0.0115	1.4103	-0.0357	1.9944	-0.0080	-2.4
ENLSVC	0.1445	-0.3550	107.532	1.0662	108.187	0.2392	70.4
ENTRYAGE	22.7750	0.0263	21.2643	-0.0547	14.2690	-0.0123	-3.6
ACAD	0.1134	0.3829	37.2341	-0.8676	36.7761	-0.1947	-57.3
POSTGRAD	0.7632	0.5887	390.142	-1.5110	336.664	-0.3390	-99.7
NODEG	0.0002	9.1626	0.0000	-------	-------	-------	-----
OPERATNL	0.3117	0.1892	31.9172	-0.4668	29.2137	-0.1047	-30.8
Observations (N=)		4075		4075			
Leavers		1385		1385			
Base Probability of Leaving		not applicable		0.3399			
Log Likelihood Ratio		-2938.447581		not applicable			
Model χ^2		not applicable		625.251			
Concordant Ratio		not applicable		72.6			

Table C37.   1980 Air Force "Late Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0785	-1.6457	18.5081	0.7431	21.6257	0.0328	70.9
HISPANIC	0.0186	0.0393	0.0016	-0.0543	0.0179	-0.0024	-5.2
OTHMINOR	0.0141	0.4403	0.1136	-0.1951	0.1358	-0.0086	-18.6
ASIAN/PI	0.0103	1.4183	0.8839	-0.5824	0.9103	-0.0257	-55.5
FEMALE	0.1560	2.3437	36.4896	-1.0142	44.0910	-0.0448	-96.7
NUMDEPS	1.0170	2.3513	91.6946	-0.9156	107.832	-0.0404	-87.3
ENLSVC	0.1565	2.7034	14.5627	-0.8782	9.9089	-0.0388	-83.8
ENTRYAGE	23.0559	-0.3414	36.2500	0.1553	39.1516	0.0069	14.8
ACAD	0.1154	10.3555	15.3272	-3.9074	15.1465	-0.1725	-372.7
POSTGRAD	0.1260	5.4177	47.6205	-2.2845	58.6405	-0.1009	-217.9
NODEG	0.0030	-1.4177	1.2149	0.5253	0.7462	0.0232	50.1
OPERATNL	0.3867	4.8226	99.3898	-1.8576	120.369	-0.0820	-177.2
Observations (N=)		7949		7949			
Leavers		368		368			
Base Probability of Leaving		not applicable		0.0463			
Log Likelihood Ratio		-1917.100125		not applicable			
Model χ^2		not applicable		581.969			
Concordant Ratio		not applicable		83.3			

Table C38. 1983 Air Force "Attrition Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0762	0.3222	21.9605	-0.4633	21.3487	-0.1154	-24.5
HISPANIC	0.0189	0.0525	0.1768	-0.1606	0.7043	-0.0400	-8.5
OTHMINOR	0.0141	-0.1095	0.6049	0.1089	0.2461	0.0271	5.8
ASIAN/PI	0.0102	0.0342	0.0479	0.0058	0.0005	0.0014	0.3
FEMALE	0.1544	-0.1237	6.6939	0.1665	4.4362	0.0415	8.8
NUMDEPS	1.7165	0.2187	254.0056	-0.2650	178.863	-0.0660	-14.0
ENLSVC	0.1746	0.6551	109.6499	-0.8015	87.1256	-0.1997	-42.4
ENTRYAGE	22.5918	0.0147	2.4651	-0.0117	0.7241	-0.0029	-0.6
ACAD	0.1317	0.3913	53.1513	-0.4246	28.6502	-0.1058	-22.4
POSTGRAD	0.3260	1.0157	508.4466	-1.1841	402.126	-0.2951	-62.6
NODEG	0.0017	-0.1605	0.1953	-0.3908	0.4242	-0.0974	-20.7
OPERATNL	0.4308	0.2839	54.9431	-0.2116	12.9344	-0.0527	-11.2
Observations (N=)		6941		6941			
Leavers		3273		3273			
Base Probability of Leaving		not applicable		0.4715			
Log Likelihood Ratio		-7849.315016		not applicable			
Model χ^2		not applicable		989.325			
Concordant Ratio		not applicable		71.3			

Table C39.   1983 Air Force "Early Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0859	-0.2217	6.3262	0.3533	7.2829	0.0562	28.3
HISPANIC	0.0193	-0.4128	6.3863	0.5604	4.9715	0.0891	44.9
OTHMINOR	0.0141	-0.1917	0.7603	0.2405	0.5581	0.0382	19.3
ASIAN/PI	0.0098	-0.3324	1.7934	0.4979	1.8180	0.0792	39.9
FEMALE	0.1217	0.0596	0.4649	-0.0796	0.3973	-0.0127	-6.4
NUMDEPS	2.1487	0.0435	4.4871	-0.0637	4.7782	-0.0101	-5.1
ENLSVC	0.2458	-0.0239	0.1052	0.0162	0.0230	0.0026	1.3
ENTRYAGE	22.4315	0.0605	17.2585	-0.0744	13.6955	-0.0118	-6.0
ACAD	0.1325	0.7950	36.3404	-1.0257	36.4689	-0.1631	-82.2
POSTGRAD	0.4950	0.6222	99.9783	-0.8298	96.0334	-0.1319	-66.5
NODEG	0.0012	15.3715	0.0000	-------	-------	------	-----
OPERATNL	0.3990	0.7052	89.7324	-0.9271	88.3808	-0.1474	-74.3
Observations (N=)		4190		4190			
Leavers		831		831			
Base Probability of Leaving		not applicable		0.1983			
Log Likelihood Ratio		-2653.634891		not applicable			
Model χ^2		not applicable		277.537			
Concordant Ratio		not applicable		67.7			

Table C40. 1983 Air Force "Career Decision Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0768	−0.0050	0.0004	−0.0518	0.0218	−0.0018	−5.0
HISPANIC	0.0164	−0.7591	5.4519	1.0424	4.6765	0.0371	100.4
OTHMINOR	0.0134	−0.6315	2.6771	0.7948	1.9770	0.0283	76.5
ASIAN/PI	0.0089	−0.8517	2.3965	1.1506	2.1537	0.0409	110.8
FEMALE	0.1152	0.0283	0.0158	0.0775	0.0594	0.0028	7.5
NUMDEPS	2.3831	−0.0265	0.3093	0.0669	0.9709	0.0024	6.4
ENLSVC	0.2289	−1.0458	28.7010	1.6337	49.7545	0.0581	157.3
ENTRYAGE	22.4894	0.0807	6.0919	−0.0590	1.8361	−0.0021	−5.7
ACAD	0.1522	17.1759	0.0000	-------	-------	0.0000	0.0
POSTGRAD	0.6865	0.5892	15.6095	−0.8718	19.6213	−0.0310	−84.0
NODEG	0.0012	−3.2172	32.6531	-------	-------	0.0000	0.0
OPERATNL	0.4233	0.6010	9.1414	−0.9818	13.5561	−0.0349	−94.6
Observations (N=)		3359		3359			
Leavers		124		124			
Base Probability of Leaving		not applicable		0.0369			
Log Likelihood Ratio		−528.2335651		not applicable			
Model χ^2		not applicable		154.721			
Concordant Ratio		not applicable		78.2			

Table C41.   1983 Air Force "Late Decision Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0518	0.1156	0.0296	0.0380	0.0213	0.0020	3.6
HISPANIC	0.0181	−1.8954	5.4193	0.7877	5.5876	0.0415	74.4
OTHMINOR	0.0188	−0.9251	0.7628	0.5088	1.4690	0.0268	48.0
ASIAN/PI	0.0148	1.2099	0.7661	−0.3434	0.4226	−0.0181	−32.4
FEMALE	0.2030	2.2727	30.7638	−0.9197	36.5862	−0.0485	−86.8
NUMDEPS	0.7864	1.4773	44.6752	−0.5379	45.8308	−0.0284	−50.8
ENLSVC	0.1119	0.4452	0.5441	−0.0617	0.0697	−0.0033	−5.8
ENTRYAGE	22.9484	−0.3037	25.9030	0.1208	26.0624	0.0064	11.4
ACAD	0.1675	4.1200	25.4981	−1.4257	23.1195	−0.0752	−134.6
POSTGRAD	0.0501	2.9816	10.0252	−1.0826	9.5664	−0.0571	−102.2
NODEG	0.0012	−4.7430	2.9439	1.7333	2.1394	0.0914	163.6
OPERATNL	0.4329	7.1305	100.9162	−2.5470	125.811	−0.1343	−240.5
Observations (N=)		5694		5694			
Leavers		318		318			
Base Probability of Leaving		not applicable		0.0558			
Log Likelihood Ratio		−1676.417859		not applicable			
Model χ^2		not applicable		372.095			
Concordant Ratio		not applicable		79.4			

Table C42.   1987 Air Force "Attrition Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0516	0.1388	1.2561	-0.1032	0.5324	-0.0239	-6.6
HISPANIC	0.0169	0.1965	0.7927	-0.0845	0.1193	-0.0196	-5.4
OTHMINOR	0.0186	0.4419	3.2323	-0.3334	1.6491	-0.0771	-21.2
ASIAN/PI	0.0149	-0.2078	0.2119	0.2586	1.0593	0.0598	16.5
FEMALE	0.2019	-0.1313	3.4952	0.1948	5.3385	0.0451	12.4
NUMDEPS	1.4297	0.3368	177.8818	-0.3289	156.997	-0.0761	-20.9
ENLSVC	0.1137	0.2011	3.5520	-0.0937	0.6498	-0.0217	-6.0
ENTRYAGE	22.9030	-0.0212	3.0686	0.0276	3.5727	0.0064	1.8
ACAD	0.1748	1.2774	138.7393	-1.1845	137.001	-0.2740	-75.4
POSTGRAD	0.2477	1.5973	318.3070	-1.4874	313.472	-0.3441	-94.7
NODEG	0.0006	-0.8650	0.9769	0.9152	0.5454	0.2117	58.3
OPERATNL	0.4400	0.9780	201.5791	-0.9304	168.946	-0.2153	-59.2
Observations (N=)		5373		5373			
Leavers		1953		1953			
Base Probability of Leaving		not applicable		0.3635			
Log Likelihood Ratio		-5670.488524		not applicable			
Model χ^2		not applicable		1009.481			
Concordant Ratio		not applicable		74.7			

Table C43. 1987 Air Force "Early Decision Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0424	0.8532	0.7988	-0.8393	1.2787	-0.0399	-79.7
HISPANIC	0.0254	-1.9091	3.9613	1.2655	3.3735	0.0602	120.2
OTHMINOR	0.0059	------	-------	-------	-------	------	------
FEMALE	0.0365	-3.2189	19.0964	2.0857	15.4855	0.0992	198.1
NUMDEPS	0.8227	0.3664	1.9434	-0.1696	0.9413	-0.0081	-16.1
ENLSVC	0.0823	-0.8061	0.7250	0.5098	0.6824	0.0242	48.4
ENTRYAGE	21.6115	0.0789	0.3800	-0.0683	0.6344	-0.0032	-6.5
ACAD	0.0729	-4.8333	52.6174	3.2926	93.5519	0.1565	312.8
POSTGRAD	0.0119	------	-------	------	-------	------	------
NODEG	0.1408	-2.1379	14.7236	1.1898	9.7989	0.0566	113.0
OPERATNL	0.4894	0.1716	0.1598	-0.0371	0.1460	-0.0018	-3.5
Observations (N=)		1179		1179			
Leavers		59		59			
Base Probability of Leaving		not applicable		0.0500			
Log Likelihood Ratio		-262.94745		not applicable			
Model χ^2		not applicable		112.392			
Concordant Ratio		not applicable		77.4			

Table C44.   1977 Marine Corps "Attrition Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0115	-0.1561	0.6461	0.1177	0.1118	0.0294	5.6
HISPANIC	0.0253	-0.5879	7.5279	0.8913	3.3481	0.2224	42.5
OTHMINOR	------	-------	--------	-------	-------	------	------
FEMALE	0.0367	0.1793	0.7052	-0.2715	0.4546	-0.0677	-13.0
NUMDEPS	1.7446	0.4665	185.9030	-0.5846	124.98	-0.1458	-27.9
ENLSVC	0.0786	0.1783	0.9338	-0.2821	1.0313	-0.0704	-13.5
ENTRYAGE	21.6782	-0.0110	0.3287	-0.0094	0.0796	-0.0023	-0.4
ACAD	0.0524	0.2749	2.1020	-0.3966	1.7494	-0.0989	-18.9
POSTGRAD	0.1394	1.1480	45.9738	-1.3560	36.4075	-0.3383	-64.7
NODEG	------	-------	--------	-------	-------	------	------
OPERATNL	0.6698	0.2955	11.4180	0.2572	2.6631	0.0642	12.3
Observations (N=)		1069		1069			
Leavers		559		559			
Base Probability of Leaving		not applicable		0.5229			
Log Likelihood Ratio		-1244.330405		not applicable			
Model χ^2		not applicable		230.128			
Concordant Ratio		not applicable		75.8			

Table C45.   1977 Marine Corps "Early Decision Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.3725	−0.6830	12.8958	1.4647	8.8876	0.2526	114.0
HISPANIC	0.0137	−0.2516	0.4454	0.6288	0.5366	0.1085	48.9
OTHMINOR	0.0058	10.9095	0.0000	−89.80	-------	-------	------
FEMALE	0.0275	0.2954	0.8195	−0.5645	0.6267	−0.0974	−43.9
NUMDEPS	2.5373	0.0928	6.1892	−0.1886	5.4423	−0.0325	−14.7
ENLSVC	0.1098	0.0760	0.1449	−0.4164	0.9942	−0.0718	−32.4
ENTRYAGE	21.6019	−0.0178	0.5981	0.0503	0.9723	0.0087	3.9
ACAD	0.0569	−0.0425	0.0437	0.1134	0.0618	0.0196	8.8
POSTGRAD	0.2706	0.0314	0.0716	0.0870	0.1158	0.0150	6.8
NODEG	0.0020	11.0407	0.0000	−88.02	-------	-------	------
OPERATNL	0.6824	−0.0177	0.0232	0.0200	0.0063	0.0034	1.6
Observations (N=)		510		510			
Leavers		113		113			
Base Probability of Leaving		not applicable		0.2216			
Log Likelihood Ratio		−305.8344653		not applicable			
Model χ^2		not applicable		19.905			
Concordant Ratio		not applicable		58.8			

Table C46. 1977 Marine Corps "Career Decision Phase" Separation Models

Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0229	-0.0088	0.0010	-0.1012	0.0129	-0.0141	-8.4
HISPANIC	0.0127	8.4340	0.0000	-90.323	-------	-------	------
OTHMINOR	0.0076	-0.0614	0.0238	0.3617	0.7370	0.0505	30.1
FEMALE	0.0280	0.0001	0.0000	0.0655	0.0035	0.0092	5.5
NUMDEPS	2.8549	-0.0640	3.6582	0.1900	2.9962	0.0265	15.8
ENLSVC	0.1170	-0.6654	27.8987	1.9835	28.5784	0.2772	165.0
ENTRYAGE	21.5572	0.0240	1.4890	-0.0620	0.9426	-0.0087	-5.2
ACAD	0.0534	0.3875	4.7880	1.1452	4.6562	0.1600	95.3
POSTGRAD	0.3613	0.0601	0.3641	-0.1555	0.2523	-0.0217	-12.9
NODEG	0.0000	------	--------	-------	-------	------	------
OPERATNL	0.6845	0.1212	1.4232	-0.2964	0.8476	-0.0414	-24.7
Observations (N=)		393		393			
Leavers		66		66			
Base Probability of Leaving		not applicable		0.1679			
Log Likelihood Ratio		-163.4023123		not applicable			
Model χ^2		not applicable		44.831			
Concordant Ratio		not applicable		68.3			

Table C47.   1977 Marine Corps "Late Decision Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0395	1.1441	0.3085	-0.6297	0.3637	-0.0162	-61.3
HISPANIC	0.0056	41.9423	0.0000	-88.281	-------	-------	------
OTHMINOR	0.0016	41.1380	0.0000	-86.758	-------	-------	------
ASIAN/PI	0.0056	41.5960	0.0000	-87.975	-------	-------	------
FEMALE	0.0500	1.1244	0.5400	-0.5451	0.4961	-0.0140	-53.1
NUMDEPS	0.8082	0.5678	2.2905	-0.2260	1.4967	-0.0058	-22.0
ENLSVC	0.0467	-1.9673	2.1741	1.1130	2.6968	0.0287	108.4
ENTRYAGE	21.5842	-0.2909	3.2282	0.1482	3.3107	0.0038	14.4
ACAD	0.1233	0.5634	0.2062	-0.1517	0.5790	-0.0039	-14.8
POSTGRAD	0.0081	42.8263	0.0000	-88.542	-------	-------	------
NODEG	0.1144	-1.2667	1.6604	0.7442	2.3351	0.0192	72.5
OPERATNL	0.5915	2.8966	9.7046	-1.4012	11.6234	-0.0361	-136.4
Observations (N=)		1209		1209			
Leavers		32		32			
Base Probability of Leaving		not applicable		0.0265			
Log Likelihood Ratio		-190.2374868		not applicable			
Model χ^2		not applicable		21.714			
Concordant Ratio		not applicable		68.8			

Table C48.   1980 Marine Corps "Attrition Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0367	-0.0767	0.1891	-0.0867	0.0506	-0.0209	-3.5
HISPANIC	0.0054	-0.0644	0.1647	0.0668	0.0054	0.0161	2.7
OTHMINOR	0.0018	-0.3970	0.2098	0.2291	0.0119	0.0552	9.3
ASIAN/PI	0.0063	-0.0799	0.0253	-0.3129	0.1352	-0.0754	-12.7
FEMALE	0.0474	0.1983	1.6565	-0.2729	0.5260	-0.0657	-11.0
NUMDEPS	1.6708	0.4311	220.0932	-0.6684	146.916	-0.1610	-27.0
ENLSVC	0.0483	0.4469	4.4614	-0.7427	4.2462	-0.1789	-30.0
ENTRYAGE	21.5814	0.0046	0.0638	0.0098	0.0670	0.0024	0.4
ACAD	0.1333	0.3051	8.1049	-0.3298	2.7356	-0.0794	-13.3
POSTGRAD	0.0957	1.1318	43.7024	-1.5109	34.1669	-0.3639	-61.1
NODEG	0.0179	-1.1101	31.6951	38.1176	-------	9.1803	1541.1
OPERATNL	0.6878	0.2204	8.0465	-0.2882	3.0503	-0.0694	-11.7
Observations (N=)		1118		1118			
Leavers		666		666			
Base Probability of Leaving		not applicable		0.5957			
Log Likelihood Ratio		-1329.743138		not applicable			
Model χ^2		not applicable		282.950			
Concordant Ratio		not applicable		77.8			

Table C49. 1980 Marine Corps "Early Decision Phase" Separation Models

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		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0337	-0.3609	2.0017	0.7096	1.6264	0.1254	54.7
HISPANIC	0.0067	-0.2260	0.1466	0.4964	0.1589	0.0877	38.3
OTHMINOR	0.0022	11.6360	0.0000	-89.336	------	-------	------
ASIAN/PI	0.0090	-0.1155	0.0375	0.0194	0.0268	0.0034	1.5
FEMALE	0.0315	-0.3247	0.9681	0.7717	1.2880	0.1363	59.5
NUMDEPS	2.5596	-0.0857	3.7979	0.1655	3.8355	0.0292	12.8
ENLSVC	0.0626	0.0095	0.0014	-0.1307	0.0816	-0.0231	-10.1
ENTRYAGE	21.5483	-0.0073	0.0564	0.0104	0.0289	0.0018	0.8
ACAD	0.1618	0.1080	0.4128	-0.1905	0.3433	-0.0337	-14.7
POSTGRAD	0.2090	0.4096	5.0771	-0.7781	5.4301	-0.1375	-60.0
NODEG	0.0000	-------	-------	-------	-------	------	------
OPERATNL	0.7011	0.0108	0.0063	0.0022	0.0001	0.0004	0.2
Observations (N=)		445		445			
Leavers		102		102			
Base Probability of Leaving		not applicable		0.2292			
Log Likelihood Ratio		-285.8936142		not applicable			
Model χ^2		not applicable		13.135			
Concordant Ratio		not applicable		58.9			

Table C50. 1980 Marine Corps "Career Decision Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0268	−0.7010	1.4657	1.3374	1.3964	0.0714	126.2
HISPANIC	0.0060	11.3803	0.0000	−87.214	-------	-------	-------
OTHMINOR	0.0030	12.1998	0.0000	−88.648	-------	-------	-------
ASIAN/PI	0.0089	11.3045	0.0000	−87.129	-------	-------	-------
FEMALE	0.0298	11.6421	0.0000	−89.067	-------	-------	-------
NUMDEPS	2.6994	0.0472	0.3077	−0.0764	0.1935	−0.0041	−7.2
ENLSVC	0.0833	−0.9781	7.8579	1.9532	10.8915	0.1042	184.3
ENTRYAGE	21.5179	0.0149	0.0711	−0.0266	0.0505	−0.0014	−2.5
ACAD	0.1667	0.1778	0.1866	−0.3339	0.1758	−0.0178	−31.5
POSTGRAD	0.3065	−0.0058	0.0005	0.0710	0.0175	0.0038	6.7
NODEG	0.0000	-------	-------	-------	-------	-------	-------
OPERATNL	0.6905	−0.2540	0.7460	0.5222	0.7979	0.0279	49.3
Observations (N=)		336		336			
Leavers		19		19			
Base Probability of Leaving		not applicable		0.0565			
Log Likelihood Ratio		−73.61301355		not applicable			
Model χ^2		not applicable		13.445			
Concordant Ratio		not applicable		61.6			

Table C51.   1980 Marine Corps "Late Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0629	-2.0286	7.3308	1.0577	6.8108	0.0337	102.3
HISPANIC	0.0317	0.6541	0.1142	-0.3980	0.1482	-0.0127	-38.5
OTHMINOR	0.0037	41.1948	0.0000	-88.483	-------	-------	------
ASIAN/PI	0.0092	39.9479	0.0000	-87.785	-------	-------	------
FEMALE	0.0427	-0.6806	0.7065	0.3907	0.7633	0.0125	37.8
NUMDEPS	0.9603	0.8922	6.9742	-0.4396	6.4192	-0.0140	-42.5
ENLSVC	0.0720	2.3870	1.4895	-1.1237	1.2021	-0.0358	-108.7
ENTRYAGE	22.3462	-0.2187	3.0962	0.0998	2.3632	0.0032	9.7
ACAD	0.0006	42.7091	0.0000	-87.487	-------	-------	------
POSTGRAD	0.0256	1.8071	0.8247	-1.1186	1.1216	-0.0357	-108.2
NODEG	0.1154	1.0476	0.9421	-0.2015	0.1200	-0.0064	-19.5
OPERATNL	0.4982	3.8605	17.9651	-1.9775	22.4937	-0.0630	-191.2
Observations (N=)		1638		1638			
Leavers		54		54			
Base Probability of Leaving		not applicable		0.0330			
Log Likelihood Ratio		-292.3407447		not applicable			
Model χ^2		not applicable		61.344			
Concordant Ratio		not applicable		77.2			

Table C52.   1983 Marine Corps "Attrition Phase" Separation Models

		Log-Linear Survival Model		Logit Separation Model			
Variable	Mean	β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0584	−0.4048	8.9162	0.6908	5.8201	0.1644	27.0
HISPANIC	0.0303	−0.3529	3.4214	0.6246	3.0424	0.1487	24.4
OTHMINOR	0.0042	−0.0198	0.0015	−0.0434	0.0021	−0.0103	−1.7
ASIAN/PI	0.0099	0.0120	0.0011	0.0506	0.0067	0.0120	2.0
FEMALE	0.0373	0.0329	0.0372	0.1318	0.1335	0.0314	5.1
NUMDEPS	1.5186	0.4778	249.6674	−0.6151	167.526	−0.1464	−24.0
ENLSVC	0.0816	0.6274	13.7253	−0.7167	9.1964	−0.1706	−28.0
ENTRYAGE	22.5630	−0.0826	24.2133	0.1126	15.1767	0.0268	4.4
ACAD	0.0007	−1.6272	2.5327	36.6738	-------	-------	------
POSTGRAD	0.0704	0.4141	7.0538	−0.5424	4.8535	−0.1291	−21.2
NODEG	0.0134	−1.0637	13.4637	1.4380	6.2915	0.3423	56.2
OPERATNL	0.6003	0.0178	0.0577	0.0534	0.1666	0.0127	2.1
Observations (N=)		1421		1421			
Leavers		866		866			
Base Probability of Leaving		not applicable		0.6094			
Log Likelihood Ratio		−1863.096597		not applicable			
Model χ^2		not applicable		271.235			
Concordant Ratio		not applicable		74.9			

Table C53. 1983 Marine Corps "Early Decision Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0364	−0.3150	1.0508	0.4756	0.8632	0.0822	37.0
HISPANIC	0.0255	15.7442	0.0000	−89.297	-------	-------	------
OTHMINOR	0.0036	15.7780	0.0000	−89.345	-------	-------	------
ASIAN/PI	0.0091	−0.0049	0.0000	0.1106	0.0094	0.0191	8.6
FEMALE	0.0237	−0.1566	0.1271	0.2196	0.0971	0.0380	17.1
NUMDEPS	2.4790	0.0392	0.7375	−0.0628	0.7380	−0.0109	−4.9
ENLSVC	0.1366	0.3869	2.3959	−0.5730	2.2456	−0.0990	−44.6
ENTRYAGE	22.2878	−0.2190	0.4816	0.0361	0.5007	0.0062	2.8
ACAD	0.0000	-------	--------	-------	-------	-------	------
POSTGRAD	0.1475	−0.2053	1.1918	0.3023	1.0107	0.0522	23.5
NODEG	0.0018	15.4405	0.0000	−88.819	-------	-------	------
OPERATNL	0.6066	−0.2747	3.3619	0.3980	2.9328	0.0688	31.0
Observations (N=)		549		549			
Leavers		122		122			
Base Probability of Leaving		not applicable		0.2222			
Log Likelihood Ratio		−370.7492536		not applicable			
Model χ^2		not applicable		17.694			
Concordant Ratio		not applicable		56.7			

Table C54.   1983 Marine Corps "Career Decision Phase" Separation Models

Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0615	-2.1822	2.8532	0.8824	2.3471	0.0177	86.4
HISPANIC	0.0268	-1.6252	0.4781	0.7344	0.4711	0.0147	71.9
OTHMINOR	0.0173	-3.1518	1.7977	1.0574	0.9517	0.0212	103.6
ASIAN/PI	0.0158	45.5233	0.0000	-87.583	-------	-------	------
FEMALE	0.0504	1.0100	0.3520	-0.4644	0.3651	-0.0093	-45.5
NUMDEPS	0.6840	0.9921	2.4439	-0.4122	2.2290	-0.0083	-40.4
ENLSVC	0.0709	-0.9440	0.2767	0.6150	0.5811	0.0123	60.2
ENTRYAGE	22.4894	-0.1322	0.2535	0.0337	0.0817	0.0007	3.3
ACAD	0.1363	3.6229	2.2779	-1.4879	2.0542	-0.0299	-145.7
POSTGRAD	0.0087	50.7294	0.0000	-88.362	-------	-------	------
NODEG	0.0024	45.4102	0.0000	-87.169	-------	-------	------
OPERATNL	0.6296	4.8398	11.6947	-2.0637	16.2391	-0.0414	-202.1
Observations (N=)		1269		1269			
Leavers		26		26			
Base Probability of Leaving		not applicable		0.0205			
Log Likelihood Ratio		-156.4709135		not applicable			
Model χ^2		not applicable		32.214			
Concordant Ratio		not applicable		74.0			

Table C55.   1987 Marine Corps "Attrition Phase" Separation Models

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Variable	Mean	Log-Linear Survival Model		Logit Separation Model			
		β	χ^2	β	Wald χ^2	$\delta P/\delta X$	% δP
BLACK	0.0580	-0.4034	4.7144	0.5965	4.4105	0.1491	30.2
HISPANIC	0.0245	0.0165	0.0029	0.2523	0.3681	0.0631	12.8
OTHMINOR	0.0163	-1.2956	19.5561	0.1734	6.7768	0.0433	8.8
ASIAN/PI	0.0163	-0.1422	0.1682	0.0706	0.0210	0.0176	3.6
FEMALE	0.0498	0.2953	1.9788	-0.2596	0.7237	-0.0649	-13.1
NUMDEPS	1.3521	0.4776	109.7324	-0.4476	75.8120	-0.1119	-22.7
ENLSVC	0.0703	-0.1051	0.1803	0.0716	0.0602	0.0179	3.6
ENTRYAGE	22.4788	-0.2061	51.9080	0.2412	34.1484	0.0603	12.2
ACAD	0.1364	0.3691	5.4657	-0.2881	2.3661	-0.0720	-14.6
POSTGRAD	0.0482	1.3348	17.6871	-1.4083	16.1327	-0.3520	-71.3
NODEG	0.0016	-1.1068	1.7185	38.8864	-------	-------	------
OPERATNL	0.6634	0.7576	50.6452	-0.9187	39.2813	-0.2296	-46.5
Observations (N=)		1224		1224			
Leavers		604		604			
Base Probability of Leaving		not applicable		0.4935			
Log Likelihood Ratio		-1564.325482		not applicable			
Model χ^2		not applicable		216.106			
Concordant Ratio		not applicable		73.0			

Table C56.   1987 Marine Corps "Early Decision Phase" Separation Models

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